

3690



THE IRISH NATURALIST

A Monthly Journal

OF

GENERAL IRISH NATURAL HISTORY,

THE OFFICIAL ORGAN OF

The Royal Zoological Society of Ireland ; The Dublin Microscopical Club ;

The Belfast Natural History and Philosophical Society ;

The Belfast Naturalists' Field Club ; The Dublin Naturalists' Field Club ;

The Armagh Natural History and Philosophical Society ;

The Cork Naturalists' Field Club ; The Limerick and Clare Field Club.

EDITED BY

GEORGE H. CARPENTER, B.Sc., LOND.

AND

R. LLOYD PRAEGER, B.A., B.E., M.R.I.A.

VOL. VII.

DUBLIN: EASON & SON, LIMITED,
85 MIDDLE ABBEY STREET, AND 40 LOWER SACKVILLE STREET.
BELFAST: 17 DONEGALL STREET.
LONDON: SIMPKIN, MARSHALL, HAMILTON, KENT & Co., LTD.

1898.

PRINTED BY ALEX. THOM & CO. (LIMITED), 87, 88, & 89, ABBEY-STREET, DUBLIN.



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 ERRATA.

- Page 50, line 29, for "Kitys," read "titys."
 " 51, line 19, for "W. JOHNSTON," read "J. H. JOHNSTON."
 " 144, " 16, for "*Duccamina*," read "*Saccamina*."
 " 152, " 3, for "*Botaurus stellaris*," read "*Ardetta minuta*."
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INDEX.

—:O:—

- Achill, Impressions of, 135.
Acrocephalus nævius, 151.
 Adams, Lionel E.—*Hyalinia Draparnaudi*, Beck. in North Ireland, 82; *Paludestrina Jenkinsi*, Smith, var. minor, nov. in South Ireland, 199. See also under Stubbs, A. G.
 Aflalo's Natural History (Vertebrates) of the British Isles, reviewed, 107.
Agabus nemoralis, new to Ireland, 91.
 Alcock, N. H.—Daubenton's Bat in Co. Wicklow, 256; Whiskered Bat in Co. Dublin, 272.
 Algæ of Achill, 142.
Anapsis Geoffroyi, new to Ireland, 211.
Andrena labialis, new to Ireland, 208.
Anisosticta xix-punctata, new to Ireland, 211.
 Annelids, new to Ireland, 195.
 Ants, plague of, 254.
Arachnida of Kenmare excursion, 206; of Mote Park, Mount Talbot, and Clonbrock, 95.
Ardetta minuta, 51, 152.
Arenaria tenuifolia, new to Ireland, 253.
Argentina silus, new to Ireland, 257.
 Babington, C. C., Journals, memorials, and botanical correspondence, reviewed, 14.
 Ballybunion, entomology of, 61.
 Barrett-Hamilton, G. E. H.—Ferruginous Duck and Buzzard in Ireland, 152; Little Bittern in Wexford, 152; Notes on the introduction of the Brown Hare into Ireland, 69; Ornithological notes from Kilkenny, 88; Spotted Crake in Wexford, 125.
 Barton, H. D. M.—Hawfinch in Co. Antrim, 51.
 Bat, Daubenton's, in Wicklow, 256; Whiskered, in Dublin, 272.
 Beetles collected at Mote Park, Mount Talbot, and Clonbrock, 90. See also Coleoptera.
 Belfast Naturalists' Field Club, 24, 55, 84, 108, 143, 248, 290; Proceedings, reviewed, 251.
Berosus luridus, new to Ireland, 92.
 Bird notes from the North of Ireland, 170.
 Bird songs, 244, 290.
 Birds of Copeland Islands, 38; of Dublin Bay, 229.
 Bittern, Common, in Galway, 51.
 Little, in Cork, 51; in Wexford, 152.
 Black-thorn fish-hooks, 28.
Bledius longulus, new to Ireland, 138.
 Botany, of Kenmare excursion, 227. See also Flora.
Botaurus stellaris, 51.
Brachypodium pinnatum, new to Ireland, 253.
 Brennan, Rev. S. A.—Harvest Mouse, 125; *Piezodorus lituratus* in Co. Tyrone, 271; Spring flowers and birds, 124.
 British Mycological Society, 267.
Bryaxis Helferi, new to Ireland, 211.
Buchholzia fallax, new to Ireland, 197.
 Buzzard, 152.
Cænopsis fissirostris, new to Ireland, 211.
 Calcite-granite, 53.
Callitriche truncata, new to Ireland, 88.
 Cambridge, O. Pickard.—Male of *Vespa austriaca*, Panz, 18.
 Campbell, D. C.—Fulmar Petrel and Manx Shearwater at Londonderry, 20; Knot at Port Salon Lough Swilly, 256; *Nyssia zonaria* in Co. Antrim, 254.
Campylus linearis, new to Ireland, 93.
Caprimulgus europæus, 200.
 Carline Thistle, fasciated, 28.

- Carpenter, G. H.—Arachnida of Kenmare excursion, 206; Evolutionist in the Farmyard (Review of Robinson's Wild Traits in Tame Animals), 12; Ireland North and South (Review of B. and N. C. Railway Co.'s Tours in the North of Ireland, and G. S. W. Railway Co.'s Sunny Side of Ireland), 265; Spiders collected at Mote Park, Mount Talbot, and Clonbrock, 95.
- Carr, J. W.—Open-air Studies in Botany, 20.
- Caves, Irish, 52.
- Cercyon nigriceps, var. centrimaculatus, new to Ireland, 48.
- Chaster, G. W.—Abnormal Solen siliqua, 49.
- Cionus pulchellus, new to Ireland, 211.
- Circus cineraceus, 50.
- Cis alni, new to Ireland, 93.
- Clinocara undulata, new to Ireland, 211.
- Close, Rev. M. H.—Obituary notice of Dr. S. Haughton, 1.
- Cole, Prof. G. A. J.—Review of Watts's Geology for beginners, 263; Recent Contributions to the Geology of Ireland (review of Geological Survey Report, 1896, Hume's Cretaceous strata of Antrim, and C. T. Gardiner and S. H. Reynolds's papers on the Kildare Inlier, Portraine Inlier, and Bala beds and associated igneous rocks of Lambay Island), 97; a scientific guide-book (review of Praeger's Guide to Co. Down), 155.
- Coleoptera of Achill, 137; of Kenmare excursion, 211; of Mote Park, Mount Talbot, and Clonbrock, 90; of Upper Lough Erne 48; of Valencia Island, 149.
- Columba æneas, 151, 200.
- Conocephalus conicus, 247.
- Copeland Islands, 38.
- Coreus denticulatus, new to Ireland, 216.
- Cork groundrels, 22.
- Cork Naturalists' Field Club, 145, 269.
- Corymbites æneus, new to Ireland, 211.
- County and vice-county divisions of the British Isles, 194.
- Crake, Spotted, in Wexford, 125.
- Crane in Tipperary, 51.
- Cretaceous strata of Antrim (Hume), reviewed, 98.
- Cuckoo, Great Spotted, supposed, 51.
- Curlew breeding near Bray, 272.
- Cuscuta reflexa, 247.
- Cuthbert, H. K. Gore.—Entomologist at Ballybunion, Co. Kerry, 65; Hymenoptera of Kenmare excursion, 208; male of *Vespa austriaca*, 48; Plague of ants, 254; Wasp and bee hunting (review of E. Saunders's Hints on collecting Aculeate Hymenoptera), 105.
- Cybele Hibernica, 47; review of, 273.
- Dasydia obfuscaria in Donegal, 271.
- Davies, J. H.—Elatine Hydropiper in the Lagan Canal, 259; *Epilobium roseum* native in Ireland, 7; *Epilobium roseum* in Ireland -- is it native? 41; plants found at Killough, Co. Down, 245; *Saxifraga tridactylites* in Down and Antrim, 148; *Teesdalia nudicaulis* in North-east of Ireland, 198.
- Diffugia thalassia, 128.
- Dillon, Hon. R. F.—Lepidoptera of Kenmare excursion, 209.
- Donacia clavipes, new to Ireland, 94; semicuprea, do., 211.
- Donegal, Flora of (Hart's), reviewed, 240.
- Dove, Stock, in Queen's Co., 151; in Wicklow, 200.
- Dublin Microscopical Club, 23, 53, 127, 164, 247.
- Dublin Naturalists' Field Club, 25, 60, 85, 108, 144, 166, 250, 291.
- Dublin and Wicklow, fungi of, 173, 286.
- Duck, Ferruginous, 125, 152; Long-tailed, in Belfast Lough, 171.
- Elatine Hydropiper in the Lagan Canal, 259.
- Elcock, Charles.—*Sirex gigas* in Ulster, 254.
- Entelecara broccha, new to British Isles, 164.
- Entomological Notes from Poyntzpass, 168.
- Entomologist at Ballybunion, 61.

- Entomostraca, British and Irish, 124.
Epeira gibbosa, new to Ireland, 95.
Epilobium roseum, native in Ireland, 7; is it native? 41.
Equus caballus in Ireland, 20.
Ero furcata, new to Ireland, 96.
- Farran, G. P.—*Dasydia obfuscaria* in Co. Donegal, 271.
 Fauna of Achill, 135; of Mote Park, &c., 95; of Kenmare district, 206.
 Ferns and Horsetails, position of fructification, 109.
 Field Club News, 52.
 Field Club Publications (review of Journal of Limerick Club, and Proceedings of Belfast Club), 251.
Fierasfer acus (?), new to British Isles, 61.
 Fishes new to Ireland, 61, 257.
 Flora of Achill, 141; of Donegal (review), 240; of Howth, 270; of Kenmare district, 227; of Wexford, 88.
 Flowers, early, 47, 124.
 Flowers, wild, in a Dublin garden, 129.
Fredericia galba, new to Ireland, 196; *F. ulmicola*, n. sp., 195.
 Friend, Rev. Hilderic. — Irish Annelids, 168; new Irish Annelids, 195.
 Frazer, W. — Bacteria attacking ancient bronzes, 167.
 Fructification of ferns and hoisetails, 109.
Frullania tamarisci, var. *atrovirens*, 23.
Fuligula nyroca, 152.
 Fulmar at Londonderry, 20.
 Fungi of Dublin and Wicklow, 173, 286.
- Galerucella viburni*, new to Ireland, 94.
 Gardiner and Reynolds's papers on Kildare and Portrairie Inliers, and on Lambay rocks, reviewed, 99.
 Geological Survey of United Kingdom, report for 1896, reviewed, 97.
 Geology of Kenmare excursion, 228.
- Geranium pratense* in Armagh, 199.
 Gibson, Rev. T. B.—Young Red-breasts in February, 88.
 Gilmore, R. M.—Bittern in Co. Galway, 51; Nightjar in Co. Mayo, 200.
Gnomonia erythrostoma, 23.
 Gordon, Dr. Samuel, obituary notice, 153.
 Groundsels, of Cork, 22.
 Grouse disease, 200.
Grus communis, 51.
 Gull, Iceland, in Sligo, 200; Lesser Black-backed, nesting in Kildare, 186.
 Gulls, tame, 255.
 Gyles, Lena.—Wryneck in Ireland, 16.
Gymnetron pascuorum, new to Ireland, 68.
- Halbert, J. N.—Beetles collected at Mote Park, Mount Talbot, and Clonbrock, 90; coleoptera of Achill, 137; coleoptera from Valencia Island, 149; coleoptera of Kenmare excursion, 211; hemiptera of Kenmare excursion, 216.
Haltica palustris, new to Ireland, 94.
 Hanna, Henry.—Seaweeds of Achill, 142.
 Hare, Brown, in Ireland, 69; English, in Ireland, 126.
 Harrier, Hen, 50; Montagu's, 50.
 Haughton, Rev. Dr. S., obituary notice, 1.
 Hawfinch in Antrim, 51.
Hedobia imperialis, new to Ireland, 211.
Helix limbata at Belfast, 150.
 Hemiptera of Kenmare excursion, 216.
 Hepatics of Ulster, 157.
 Herrings, extraordinary run of, 19.
 Hett, Charles Louis.—Birdsongs, 290; Dictionary of Bird Notes, reviewed, 244.
 Holt, Ernest W. L.—Recent additions to the list of Irish fishes, 257.
Homalota halobrectha, new to Ireland, 138; *princeps*, new to Ireland, 138.
 Horse, Wild, in Ireland, 20.
 Horsetails, position of fructification, 109.

- Hume's Cretaceous strata of Co. Antrim, reviewed, 98.
 Hunter, J.—*Pottia recta* (Mitt.) in Co. Donegal, 167.
 Hurst, C. H., obituary notice, 153.
Hyalinia Draparnaudi in North Ireland?, 82.
Hydnum cinereum, new to British Isles, 286; *H. cetraceum*, 53.
Hydrobia Jenkinsi in Donegal, 150; in Down, 271; var. *minor*, nov., 199.
 Hyland, John Shearson, obituary notice, 153.
Hylotrupes bajulus, new to Ireland, 93.
 Hymenoptera of Kenmare excursion, 208.
 International Zoological Congress, 87.
 Irish Field Club Union Conference, Kenmare, 201.
Isotoma litoralis, new to British Isles, 54.
lynx torquata, 16.
 Joyce, Margaret E.—*Neotinea intacta* in Co. Galway, 149; Grasshopper Warbler, 151.
 Johnson, Prof. T. — obituary notice of Dr. C. H. Hurst, 153.
 Johnson, Rev. W. F.—entomological notes from Poyntzpass, 168; spring migrants at Poyntzpass, 171.
 Johnston, J. H.—Crane in Co. Tipperary, 51; early *Pararge megæra* in Co. Tipperary, 149.
 Kane, W. F. de V.—*Lepidoptera* of Achill, 135; *Sphinx convolvuli* in Ireland, 271.
 Kenmare conference, Irish Field Club Union, 201.
 Kenmare district, fauna and flora of, 201; mollusca of, 261.
 Knot at Portsalon, 256.
 Knox, E. Blake.—Curlew breeding near Bray, 272; grouse disease in Ireland, 200; Stock Dove in Co. Wicklow, 200; Woodlark in Co. Wicklow, 256.
 Land-shell pockets in sand-dunes, 77.
 Larvæ, tube-forming, 4.
 Leeches, Irish fresh-water, 188.
Lepidoptera of Achill, 135; of Kenmare excursion, 209.
Leptoptegnia, 29, 54; *bandoniensis*, sp. nov., 32, 54.
Leptura fulva, *L. livida*, and *L. scutellata*, new to Ireland, 93.
Leptyphantes flavipes, 96.
Lepus europæus, 69, 126.
Listeva pubescens, new to Ireland, 149.
Leucojum æstivum, new to Ireland, 88.
 Limerick Field Club, 57; Journal (review), 251.
Limnæa involuta, 224, 262.
Liodes humeralis, new to Ireland, 211.
Lissodema iv.-punctata, new to Ireland, 211.
 Long-tailed Duck in Killala Bay and the Moy estuary, 121.
 Lough Erne coleoptera, 48.
Lunularia cruciata, 164.
Lyctus canaliculatus, new to Ireland, 211.
Lytta vesicatoria, new to Ireland, 90, 94.
 MacEandoo, Rev. Wm. — Tame Gulls, 255.
 MacIntosh, W. C.—Note on a post-larval *Fierasfer*, 61.
 Mahaffy, Rachel M.—Additions to the flora of Howth, 270.
Malthodes flavoguttatus, new to Ireland, 211.
 Marten breeding in Waterford, 171.
Medicago maculata in Wicklow, 198.
Melasoma æneum, new to Ireland, 211.
Merulius lachrymans, 165.
 Mice of North Bull, 152.
Microglossa pulla, new to Ireland, 92.
 Migrants, spring, 124, 151, 171.
 Miller, Rev. R. M.—*Saxifraga umbrosa* in Queen's County, 148; Stock Dove in Queen's County, 151.
 Moffat, C. B.—Bird Songs (review of Hett's Dictionary of Bird Notes), 244; spring migrants in Co. Wexford, 151; visit to the Copelands, 38.
 Mollusca, of Achill, 139; of Kenmare excursion, 218; of sand-dunes, 77; of South-west Ireland, 261; of Skelligs, 9, 49; of Tipperary, 169.

- More's Life and Letters, reviewed, 101.
 Mosses and Hepaticæ of Ulster, 157.
 Mote Park, zoology of, 89.
 Moticilla alba, 160.
 Mouse, Harvest, 125.
- Naturalists' Directory, 1898, reviewed, 106.
 Nectria sanguinea, 23.
 Neotinea intacta in Galway, 149.
 Newton, D. M. P.—*Geranium pratense* in Co. Armagh, 199; *Pinguicula* in Co. Wicklow, 199.
 Nightjar in Mayo, 200.
 Nostoc sphærium, 165.
 Nyssia zonaria in Antrim, 254.
- Obituary notices. — Dr. Samuel Gordon, 153; Dr. S. Haughton, 1; Dr. C. H. Hurst, 153; John Shearson Hyland, 153; Dr. G. M. O'Connor, 15.
 Odontia barbajovis, 247.
 Oligota punctulata, new to Ireland, 149.
 Opatrum sabulosum, new to Ireland, 211.
 Open-air Studies in Botany, 20.
 Orchesia micans, new to Ireland, 211.
 Ornithological notes from Kilkenny, 88.
 Orthotylus chloropterus, new to Ireland, 216.
 Oxytelus maritimus, new to Ireland, 138.
- Pachygnatha Listeri, new to Ireland, 96.
 Pachyta collaris, new to Ireland, 93.
 Pack-Beresford, Denis R.—Tube-forming larvæ, 4.
 Pæderus litoralis, new to Ireland, 92.
 Palmer, J. E.—Lesser Black-backed Gull nesting in Co. Kildare, 186.
 Palorus melinus, new to Ireland, 68.
 Paludestrina Jenkinsi, 150, 271; var. minor, nov., 199.
 Paracymus nigroæneus, new to Ireland, 202, 211.
 Pararge megæra in Tipperary, 149.
 Patten, C. J.—Birds of Dublin Bay, 229.
 Patterson, Robert.—Bird notes from the North of Ireland, 170.
- Patterson, R. Lloyd.—Long-tailed Duck in Belfast Lough, 171.
 Phillips, J. St. J.—Geology of Kenmare excursion, 228.
 Phillips, R. A.—*Arenaria trinervia* L. in Ireland, 253; *Brachypodium pinnatum*, an addition to the Irish flora, 253; the Cork ground-sels, 22.
 Phlæocaris subtilissima, new to Ireland, 149.
 Phytodecta olivacea, new to Ireland, 211.
 Pickard Cambridge, see Cambridge.
 Pim, Greenwood.—The Fungi of the Counties of Dublin and Wicklow, 173; *Medicago maculata* in Co. Wicklow, 198.
 Pinguicula in Wicklow, 199.
 Pirata hygrophilus, new to Ireland, 96.
 Plagiodera versicolor, new to Ireland, 211.
 Plants found at Killough, 245; Irish, 270.
 Plezodorus lituratus in Tyrone, 271.
 Porter, Endymion—Coleoptera of Upper Lough Erne, 48.
 Porzana maruetta, 125.
 Pottia recta in Donegal, 167.
 Praeger, R. Lloyd.—Alexander Goodman More (review of Life and Letters), 101; *Arenaria tenuifolia*, L. in Ireland, 253; botany of Kenmare excursion, 227; Charles Cardale Babington (review of Journals, memorials, and botanical correspondence), 14; a County Flora (review of White's Flora of Perthshire), 172; Cybele Hibernica (review), 273; early flowers, 47; Flora of Donegal (Hart's), review, 240; flowering plants of Achill, 141; general account of Irish Field Club Union Conference, Kenmare, 201; *Geranium pratense* in Co. Armagh, 199; Guide to Co. Down and Mourne Mountains (reviewed), 155; Naturalists at Mote Park, 89; on the position of the fructification in certain British ferns and horsetails, 109; a plague of ants, 254; recent Field Club publications (review of Journal of Limerick Club and Proceedings of Belfast Club), 251. See also Tatlow.
 Protection of Wild Birds, 170.

- Quedius longicornis*, new to Ireland, 92.
- Radula Carringtoni*, 128.
- Rea, Carleton.—Additions to Mr. Greenwood Pim's "Fungi of the Counties of Dublin and Wicklow," 286.
- Redbreasts, young, in February, 88.
- Redpoll, Mealy, 50.
- Redstart, Black, in King's Co., 50.
- Reed's papers on Waterford geology, reviewed, 44.
- Reviews.—Aflalo: Sketch of the natural history (vertebrates) of British Isles, 107; B.N.C. Railway: Tours in the North of Ireland, 265; Babington: memorials, journals, and botanical correspondence, 14; G.S.W. Railway: Sunny Side of Ireland, 265; Cybele Hibernica, 273; Gardiner and Reynolds: The Kildare Inlier, the Portraine Inlier, and Bala beds and associated igneous rocks of Lambay Island, 99; Geological Survey: report for 1896, 97; Hart: Flora of Donegal, 240; Hett: Dictionary of bird notes, 244; Hume: Cretaceous rocks of Antrim, 98; More: Life and Letters, 101; Praeger: Guide to Co. Down, 155; Reed: papers on Waterford geology, 44; Robinson: Wild traits in tame animals, 12; Saunders: Hints on collecting aculeate hymenoptera, 105; Watts: Geology for beginners, 265; White: Flora of Perthshire, 172.
- Rhagonycha unicolor*, new to Ireland, 211.
- Robinson's Wild traits in tame animals, reviewed, 12.
- Rosæ, Irish, 167.
- Royal Zoological Society, 23, 53, 84, 108, 126, 143, 164, 198, 247, 269, 290.
- Ruticilla titys*, 50.
- Salda Muelleri*, new to Ireland, 216.
- Saprolegniaceæ, 29.
- Saunders's Hints on collecting aculeate hymenoptera, reviewed, 105.
- Saxifraga tridactylites* in Down and Antrim, 148; *S. umbrosa*, in Queen's Co., 148.
- Scharff, R. F.—British and Irish vertebrate zoology (review of Aflalo's sketch of the natural history (vertebrates) of the British Isles), 107; English Hare in Ireland, 126; Harvest Mouse, 125; The Irish fresh-water Leeches, 188; Land mollusca of Great Skellig, 9, 49; Wild Horse (*Equus caballus*) in Ireland, 20.
- Seals in River Lee, Cork, 88.
- Seaweeds of Achill, 142.
- Senecio hybrids*, 22.
- Sericosomus brunneus*, new to Ireland, 93.
- Seymour, H. J.—Recent geological work in the County of Waterford (review of F. R. Cowper Reed's papers), 44.
- Shearwater, Manx, at Londonderry, 20.
- Sinclair, W. F.—The observation of Waders, 289.
- Sirex gigas* in Ulster, 254.
- Sisyrinchium angustifolium* at Coosheen, Co. Cork, 270.
- Skellig, mollusca of, 9, 49.
- Solen siliqua*, abnormal, 49.
- Song of birds, 290.
- Sphinx convolvuli*, 271.
- Spiders collected at Mote Park, Mount Talbot, and Clonbrock, 95. See also Arachnida.
- Standen, R.—Mollusca of Kenmare excursion, 218.
- Stenus lustrator*, new to Ireland, 137.
- Stock Dove in Queen's Co., 151; in Wicklow, 200.
- Stubbs, A. G. and Lionel E. Adams.—Supplementary notes on the mollusca of South-west Ireland, 261.
- Sunny Side of Ireland, reviewed, 265.
- Swan, Allan P.—On the genus *Leptolegnia* of the Saprolegniaceæ, 29.
- Swan, Lilian M.—*Sisyrinchium angustifolium* at Coosheen, Co. Cork, 270.
- Syngnathus rostellatus*, new to Ireland, 258.
- Tachyporus pallidus*, new to Ireland, 92.
- Tatlow, Emily M.—Wild Flowers in a County Dublin Garden, 129.

- Tatlow, Emily M., and R. Lloyd Praeger. — Marine mollusca of Achill, 139.
- Teesdale, John H. — Montagu's Harrier breeding in Ireland—a correction, 50.
- Teesdalia nudicaulis in North-east of Ireland, 198.
- Thymelus limbatus, new to Ireland, 211.
- Tours in the North of Ireland, reviewed, 265.
- Trichia affinis, 165.
- Tringa canutus, 256.
- Tube-forming larvæ, 4.
- Tuber dryophilum, new to Ireland, 53.
- Tychius tomentosus, new to Ireland, 68.
- Ussher, R. J. — Breeding of the Marten in Co. Waterford, 171.
- Vespa austriaca, male, 18, 48.
- Vespertilio Daubentonii, 256: V. mystacinus, 272.
- Waddell, Rev. C. H. — Irish Rosæ, 167; Notes on mosses and hepaticæ of Ulster, 157.
- Waders, observation of, 289.
- Wagtail, White, 160.
- Warbler, Grasshopper, in Galway, 151.
- Warren, Robert. — Extraordinary run of Herrings in the Moy estuary, 19; Iceland Gull in Co. Sligo in summer, 200; Long-tailed Duck in Killala Bay and the estuary of the Moy, 121; White Wagtail in Ireland, 160.
- Waterford geology, 44.
- Watts's Geology for beginners, reviewed, 263.
- Welch, R. — Helix limbata, Drap. a Pyrenean shell, introduced at Belfast, 150; Hydrobia Jenkinsi in Co. Donegal, 150; Hydrobia Jenkinsi in Co. Down, 271; Land mollusca of Co. Tipperary, 169; Land-shell pockets in sand-dunes, 77.
- Welland, J. — Whiskered Bat in Co. Dublin, 272.
- Wexford, flora of, 88.
- White's Flora of Perthshire, reviewed, 172.
- Wild-flowers in a Co. Dublin garden, 129.
- Witherby, Harry F. — Black Redstart in King's Co., 50.
- Wolfe, John J. — Little Bittern in Co. Cork, 51.
- Woodlark in Wicklow, 256.
- Wryneck in Ireland, 16.
- Xenusa sulcata, new to Ireland, 138.



Photo. by Chancellor, Dublin.

REV. DR. SAMUEL HAUGHTON,
F.T.C.D., F.R.S.

The Irish Naturalist.

VOLUME VII.

REV. SAMUEL HAUGHTON

M.D., S.F.T.C.D., F.R.S.



IN the departure from amongst us of Rev. Dr. Haughton (whose death took place on October 31, 1897), Dublin will miss the familiar form of a prominent citizen, well known for his usefulness in various lines of activity, and Trinity College loses a distinguished member and officer of great working capacity, one also who was among the foremost in assisting to carry out her rôle of the cultivation of knowledge. Dr. Haughton was born in Carlow in 1821. At the early age of 23 he was elected Fellow of Trinity College, and in 1881 he was co-opted Senior Fellow of the same. Having begun his scientific career as a mathematician and mathematical physicist, by which he obtained his Fellowship, he, afterwards, as Professor of Geology and as M.D., became engaged with subjects which come more within the purview of the *Irish Naturalist*, such as botany, zoology, and mineralogy. As regards physical geology, which sometimes runs into cosmology, his knowledge of mathematics and physics enabled him to handle problems which could not be successfully attacked by many an ordinary geologist. In this way the versatility of his powers and the variety of his attainments came in with great advantage. We may here observe that this is shown also by his work on the "Principles of Animal Mechanics" (London, 1873). This was a subject in which he took special interest, and to which he paid much attention, for many years. He shows how it illustrates the very important economical principle, displayed also in other regions of Nature, the *Principle of Least Action*. The treatment in this book

is confined to the vertebrate muscular system of man and lower animals. The combination of Dr. Haughton's knowledge of anatomy, with his skill in mathematics, which is not often imported into the dissecting room, here stood him in good stead, and enabled him to pursue the subject as could not otherwise have been done. The result, however, is that this book appeals only to a small class of readers, those who inhabit the somewhat confined space in which the areas of anatomy and of mathematics overlap. Dr. Haughton's "Lectures on Physical Geography," 1880, printed in the Dublin University Press Series, exhibit the same combination of varied knowledge. His books on elementary science include a "Manual of Geology," the "Three Realms of Nature," &c.; some were written in conjunction with his friend, Professor Galbraith; most of these were very popular as manuals, and had a large circulation. But Dr. Haughton's great scientific activity found vent chiefly in writing important papers in the publications of many scientific societies, and in various scientific periodicals. We cannot give a list of these here. In the Royal Society's Catalogue of Scientific Papers will be found an array of no less than 206 papers by Dr. Haughton, besides a few written by him in conjunction with others. These are on a wonderful variety of subjects, displaying an almost encyclopædic knowledge. His distinguished merits were widely recognized not only in Ireland but elsewhere. Thus he was elected Fellow of the Royal Society of London in 1858 (in the *Transactions* and *Proceedings* of which Society he appears as a contributor of papers on various important subjects). The University of Oxford conferred on him, *honoris causa*, the degree of D.C.L., and the Universities of Cambridge and of Edinburgh that of LL.D., and the University of Bologna that of M.D., he having already that degree in his own University of Dublin. He was also honorary member of various foreign scientific societies. While these distinctions were bestowed upon him *honoris causa*, he was appointed Secretary of the Royal Zoological Society of Ireland, with its Zoological Gardens, for a quite different reason, viz., because the Council of the Society saw that he was the person best fitted for the post, which was, at that time, a very arduous one. He fully justified their selection. By the energy, along with the practical capacity, which, for just twenty years, he

devoted to the duties of that office, he enabled the Society to tide over difficulties and crises which but for him might have proved disastrous—another illustration, by the way, of the varied character of his powers. He was not only a very eminent man of science, but an unusually efficient man of affairs. We may here refer to the useful part played by him in the building up of the School of Engineering, and in the reconstruction of the School of Physic in the University of Dublin, and in the improvement of the management of Sir Patrick Dun's Hospital connected with that School. He was, for thirty-years, an active member of the Council of the Royal Irish Academy, and President thereof from 1886 to 1891; in its *Transactions* and *Proceedings* most of his principal scientific papers were published. Though absolutely devoid of any selfish desire of ruling, he was a leading spirit in any undertaking in the management of which he was concerned. He always showed great sympathy with Ireland and with Irish causes; doubtless it was this, together with the general interest in literature which he possessed, which prompted him to acquire a knowledge of the Irish language.

His brightness, humour, and remarkable individuality endeared him to a wide circle of acquaintance who were but little cognizant of his life-work. It has become perhaps too much of a fashion of speech to say, of one of the departed, that they who were most familiar and intimate with him esteemed him most; but never was the saying more strictly true than in his case.

Dublin.

M. H. CLOSE.

TUBE-FORMING LARVÆ.

BY DENIS R. PACK-BERESFORD.

IN the interesting paper on tube-forming worms contributed by Mr. Friend to the *Irish Naturalist* for November last, he remarks that old writers on natural history often confounded the worms of which he is treating, with the larvæ which abound in similar situations, belonging to midges of the genus *Chironomus*, and which being of a bright red colour are commonly known as "blood-worms." That it is easy enough for unscientific people to mistake these larvæ for worms is clear from the fact that Mr. Friend was himself once taken in by outward appearances, as he describes on page 102 of the last volume. Although having no pretensions to being a scientific naturalist, I have during the past summer been much interested in watching the habits of the larvæ, to which reference is made above, and with a view to helping other amateurs like myself to recognise these larvæ when they meet them, and to prevent their confusing them with worms, I think an account of my observations may possibly be of interest. The first time I noticed these larvæ was early last spring, when searching for gnat-larvæ, to show to a young friend. Whether they have been more common than usual this summer or not I cannot say, but certainly I have never noticed them in such quantities before. The old water-barrel in which I first came across them had a layer of mud at the bottom, and this had quite a red colour which instantly disappeared on my approach. After watching a few moments I noticed first one and then another little red worm-like creature coming partly out of his burrow in the mud and waving vigorously from side to side. I at once collected a cup-full of the mud and put it into an old bottle, which was the only form of aquarium handy.

When the mud settled down there were none of my little friends visible, they having all buried themselves. In the course of a day or two, however, I was amply rewarded for my trouble, by finding them all emerging from their holes and waving vigorously to and fro. Some too had been so

accommodating as to make their burrows beside the glass, so that I was able to watch them very easily and to study their mode of procedure.

Having worked the hole underground to their satisfaction, they proceeded to search all round the mouth for building materials, and a regular tube was then built up by imperceptible degrees over the mouth of the burrow, the whole being about half as long again as the animal inhabiting it. In some cases the tubes were nearly all underground, in some about half and half, and in some the tubes were made altogether above the level of the mud, sometimes on the side of the glass, at others on bits of sticks or grass. I have since found these tubes on the sides of a cemented tank several inches above the bottom. These larvæ are voracious feeders, like all their kind, and I found that if I put a dead leaf or bit of decaying grass into the bottle, they nearly all came out of their tubes and did not leave the leaf till they had picked it clean, when they returned home.

I could not be certain that each animal invariably returned to his own burrow, though in many cases I was able to watch they certainly did so. Sometimes, too, they would leave their holes and wriggle to near the surface of the water, where they would stop for some little time before going down again.

Although it is believed that these excursions are made for the purpose of breathing air, I could never make out that they did so, as they were never still for a moment. The waving motion of their bodies was kept up, even when deep down in their tubes, and seemed to be used to keep the water in circulation, and assist respiration, which is believed to be carried on by means of the two pairs of appendages on the last abdominal segment but one, and the shorter appendages on the last segment.

The caterpillar-like appearance of the creatures—the head provided with short antennæ and strong biting mandibles—the pair of sucker-feet with circles of hooks, on the first and also on the last segment of the body—stamps them at once as larvæ, and distinguishes them clearly from annelids of similar habits. I was not, therefore, surprised to see them gradually become less and less vigorous in their movements and eventually turn into pupæ, which after a time wriggled out of their

tubes and rising to the surface, with many violent contortions emerged as full-blown flies.

Being anxious to try and study the earlier stages of these larvæ I returned to my water-barrel, and before long found floating on the surface a small mass of jelly, the lower portion of which was filled with eggs, laid in a long spirally-coiled gelatinous tube. The top portion, which consisted of long threads of jelly, seemed to be used to keep the lower part afloat, and, probably, in other cases, to anchor it to floating leaves, etc. These eggs I watched hatching. The grubs were at first minute and colourless. They gradually increased in size and colour, till they were, roughly speaking, about one inch in length and of the beautiful blood-red colour already described. The pupa is provided with two tufts of breathing filaments, set one on each side of the thorax, and also with another tuft on the tail, all pure white. These distinguish the creature very clearly from the common gnat pupa, there being no sign of the air-tubes or horns which one sees on the latter, the fact that the *Chironomus* pupa never leaves its burrow till ready for its final change necessitating the adaptation described.

The imago of a *Chironomus* midge is, to the unscientific eye, very like a common gnat, but its earlier stages are so very distinct from those of the gnat, and the flies are in reality so dissimilar that they are classed by entomologists in separate families.

The resemblance between these larvæ and the worms described by Mr. Friend can, of course, only be a very superficial one, but still the colour, the fact that they both build tubes, are very gregarious, and are both found in the same sort of places, all help to make it easy for the casual observer to confound them.

Fenagh House, Bagenalstown.

EPILOBIUM ROSEUM, SCHR. NATIVE IN IRELAND.

BY J. H. DAVIES.

LATE in the season as it is—October, 1897—I have just now had the satisfaction of finding this Willow-herb in both the counties of Down and Antrim. In the former it occurs on a wall, overshadowed by a hedge, at Ballyskeagh, close by the bridge over the Lagan Canal; in the latter, in an old plantation by the River Lagan at Glenmore, and also by a stream-side not far away, on a moist shady wall overgrown with *Chrysosplenium oppositifolium* and *Marchantia polymorpha*; and in all these places it is associated with the ubiquitous *E. montanum*. That the species in both counties is truly native, there seems nothing to suggest the slightest misgiving.

Many times I must have seen it in these spots before, and partly perhaps because it was not in my mind, but chiefly because I was unacquainted with its *facies*, I have hitherto failed to recognise it, and have passed it by as the common species (*E. montanum*) amongst which it grows. It might still have been unnoticed were it not that some reference was made to it in a recent letter from my constant correspondent, Mr. Foggitt, who supplied me with precise information as to the character of the places in which he usually meets with it in Yorkshire, and I was thus led to make particular examination of *Epilobia* growing in such situations as he indicated.

According to the authors of "Flora of the North-East of Ireland" (1888) its only previous claim to a place in the list of Irish plants is that in the Babingtonian herbarium there is a specimen marked "Belfast, 1846, W. Thompson." Both Mr. Stewart and the late Mr. T. H. Corry, as I know, have made diligent search for it about Belfast and in other places where it is said to have been found, but in vain. It is, therefore, recorded by them within brackets, as a casual only.¹

In *Cybele Hibernica* it is noted for the north-eastern district only, and that as doubtfully native. The localities of "Banks of Lagan near Cranmore" and "Glen in the Holywood Hills" are mentioned as requiring confirmation, "since they may prove the plant to be an undoubted native." The identification, therefore, near the side of the canal at Ballyskeagh, which is little over two miles from Cranmore, and by the bank

¹See note in "Flora N.E. Ireland," p. 54.

of the Lagan near Lisburn, some two miles farther up the river, may be considered a very near approach to the desired confirmation as to Templeton's Cranmore station, rejected on the ground of erroneous determination, and will thus be of interest to Irish botanists. Mr. Praeger, in *Irish Naturalist*, vol. vi., p. 93 (1897), records *E. roscum* as having been discovered by him near Queensboro', Co. Louth, in 1896, and attaches to the name a mark denoting that he considers the plant to have been probably introduced there.

It is not supposable that a plant so well fitted for wide dissemination is not to be found elsewhere in the district, but the year is too far advanced to search for it with much likelihood of success. In fact, the flowers remaining when the species was first detected were so few that I could not identify, with certainty, more than some twenty plants, though there were many others which I believed to be the same; but in the absence of inflorescence it was unwise to be positive.

Except in the flower the plant here appears to be more variable than *E. montanum*. The raised stem-lines are absent in some examples, and in others they are only faintly discernible. The leaves, which are rather flaccid, are in some instances less narrowed at the base than is the case in others, and their petioles differ in length, though in all the plants the leaves are more evidently stalked than in the other species. The characteristic form of the flower, however, seems to be constant. It is not rose-red, as described by some writers, but very pale, almost white, with rosy streaks; in size smaller than in *E. montanum*, the petals exceeding the calyx-segments by about only one-fourth, and the stigma is clavate, never four-cleft as in the other species. The whole plant is more glabrous, and so fragile that, unless some care be taken in gathering, the stems are very easily broken.

Though having no lack of confidence in the accuracy of my diagnosis of the plant, I should not have remained satisfied without verification by some of those who had more acquaintance with it than I could claim, and specimens were accordingly submitted to Mr. Foggitt and Mr. Stewart, both of whom assure me that the determination is correct.

Glenmore Cottage, Lisburn.

THE LAND MOLLUSCA OF THE GREAT SKELLIG.

BY R. F. SCHARFF, PH.D.

THE Great Skellig or Skellig Michael, lies about ten miles in a straight line from the nearest land—the coast of Kerry. It is one of the most westerly points in Europe, and from that circumstance alone a complete list of its animal inhabitants would be of interest. But I propose to deal only with the land-shells which have been found living on it. Excepting in fine weather with a fair wind, the island is quite inaccessible. The face of the rock rises precipitously out of the water for several hundred feet, and landing is possible on the eastern side only, where narrow ledges project from the surface of the water to the summit of the cliff. In rough weather, the waves envelop the lower part of the rock, whilst the spray mounts up to the summit, which is about 800 feet above high water mark.

The flora of the island, as might be expected, is scanty. But I am informed by Mr. Colgan that no list of the plants occurring on the rock has been published. He referred me, however, to a note in the *Irish Naturalist* (vol. ii., p. 189), on some plants which have been observed on a neighbouring island—the Little Skellig—by Mr. A. Delap. I notice that among these one plant in particular—the Tree Mallow (*Lavatera arborea*)—is in the British Islands confined to the western shores.

Geologically, the Great Skellig, as well as the Little Skellig and the Lemon Rock, forms a continuation of the promontary which ends in Bolus Head. The rock of which they are composed belongs to the Old Red Sandstone series. According to Mr. G. H. Kinahan, there are on the Great Skellig green and purple grits and also purple slates full of calcareous layers and patches.

From a distributional point of view an enumeration of the animal inhabitants of this lonely island is of great interest. Accidental transport of species by either wind or waves from the mainland is out of the question, since the first generally blows from the west, and waves would probably fail to wash animals on to a safe landing-place. The chance of

birds being carriers of land-shells is so remote a contingency that it need scarcely be looked upon as entering within the range of possibilities. We might therefore consider the natives of the Great Skellig to be the descendants of species which walked or crawled to it on dry land long years ago when the rock was the summit of a mountain standing on a plain which formed part of the mainland. One unfortunate circumstance, however, deprives the animal inhabitants of this proud position. Monks formerly lived on the island, and built a rough stone chapel on the summit with steps leading to it, and it is possible that there was in ancient times free intercourse with the mainland, from which some of the species may then have been accidentally introduced. In more recent years a lighthouse has been built on the island, and an occasional supply of vegetables sent to the keeper might contain a species or two which possibly could propagate and leave a numerous progeny on the rock.

But the molluscan fauna contains some species characteristic of uncultivated ground, which certainly would never take shelter among vegetables or near houses, so that I think they cannot have been accidentally introduced. Indeed there are but few species in the list which might owe their existence on the rock to accidental introduction. Such are *Agriolimax agrestis*, *Hyalinia cellaria*, *Helix rotundata*, and *Pupa cylindracea*.

For samples of specimens from the island, I am specially indebted to the Rev. A. H. Delap, who on frequent visits never omitted to bring back with him a little box full of slugs and snails. But other people not less interested in natural science have visited the island. Thus a number of species were recently collected by Prof. Boyd Dawkins, and duly recorded by Mr. R. Standen in the *Journ. of Conchology* (vol. viii., 1897). Mr. R. Welch, of Belfast, kindly supplied me with a list of the shells collected by Mr. S. K. Kirker and by the Rev. H. W. Lett in 1897. We have, therefore, probably got together a fairly complete list of all the species found on the island, especially when we take into account the list published by Mr. Cockerell¹ of Mr. Delap's earlier captures.

¹ *Zoologist* (3rd ser.), vol. x., 1886.

ZONITIDÆ.

Hyalinia cellaria—(Standen).

H. nitidula—(Standen).

H. alliaria*—(Standen, Welch, Cockerell).—It is significant that this, the most sylvan of all the British *Hyalinæ*, should be the only common species of the genus living on the island. All the specimens I received from Mr. Delap and also those recorded by Messrs. Welch and Standen belong to the greenish form (f. *viridula*), but Mr. Cockerell mentions having among many specimens seen a few pale brown ones. None of the specimens I examined had a trace of the usual garlic smell.

ARIONIDÆ.

Arion ater*—Olive and black varieties.

A. subfuscus—(Standen).

A. intermedius* (*minimus*)—Orange-yellow variety.

LIMACIDÆ.

Limax marginatus* (*arborum*)—

a. Uniformly grey without bands;

b. Light grey with thick black bands on body and mantle.

HELICIDÆ.

Helix rotundata* (Cockerell, Welch, Standen)—Small, otherwise identical with continental specimens.

H. ericetorum*—Immature.

H. acuta*—Immature.

H. nemoralis* (Cockerell, Welch, Standen). All conical in shape and mostly much weathered. Among twenty-eight specimens I received, there were twenty-seven of a lemon yellow colour (*libellula*), and one of a brownish red (without bands). Five of the twenty-seven yellow ones were without bands, the remainder containing the following band formulæ:—

15 specimens, 12345.

1 „ 10345.

2 „ (12) 3 (45).

1 specimen, 1 (23) 45.

1 „ 00300.

2 „ (123) (45).

Cochlicopa lubrica—(Welch, Standen).

Pupa cylindracea*—(Cockerell, Welch, Standen).—Mr. Cockerell describes his specimens as pale and almost edentulate, whilst Mr. Standen refers the Skellig form to the variety *curta*, but it seems to me to be identical with the variety *anconostoma*, of which we possess specimens in the Dublin Museum from St. Helena and Trieste, and which also occurs in the Canary Islands, the Azores, and in Southern Europe, generally.

* The species marked with an asterisk are those of which I have myself seen and identified specimens.

Science and Art Museum, Dublin.

THE EVOLUTIONIST IN THE FARMYARD.

Wild Traits In Tame Animals, being some familiar studies In Evolution. By LOUIS ROBINSON, M.D., 8vo, pp. viii., 329. 6 plates and 10 illustrations in the text. Edinburgh and London : William Blackwood and Sons, 1897. Price 10s. 6d. nett.

Dr. Robinson's object in this interesting and suggestive book is to point out how the common and easily observed habits of our domestic animals throw light on the ways of their wild ancestors. The qualities which make our four-footed friends valuable and serviceable to us are traced back, with more or less probability, to the needs of the primitive animal societies before these were disturbed by the appearance of man. Dr. Robinson, appropriately enough, begins with ourselves, and traces the pleasure which the modern naturalist takes in the study of the living things around him to the necessities of his savage ancestor, who depended for his food on his powers of observing natural objects and reasoning from what he saw. The fidelity of the Dog to his master represents the primitive instincts of animals accustomed to hunt in packs and dependent for their success on mutual co-operation. Perhaps, however, some readers of Dr. Robinson's pages will feel too much respect for the modern dog's intelligence to accept the theory that he regards the members of the human family, whose home he shares, as "elongated and abnormally cunning dogs."

The contrasts between our two domesticated species of *Equus*—the Horse and the Ass—are explained by the different surroundings of the two species in their wild state. The swiftness of the horse was necessary to a plain-dwelling animal which had to flee for life from the pursuit of wolves or wild dogs; while the habit of shying, sometimes so objectionable in modern horses, tells of a time when a deadly enemy might lurk in any thicket. The sure-footed, rough-coated, strong-nerved ass, on the other hand, is marked by those characters as originally a mountaineer. The strong aversion to enter a stream of water is believed by our author to be a survival of the instinct which led his ancestors, in their primitive African home, to avoid plunging into rivers which were the abode of crocodiles. Several times in the book does Dr. Robinson refer to the "inbred horror of lizards and snakes" shown by most mammals. He believes this to be a "vestigial echo of the long and deadly struggle between the warm and cold-blooded populations which must have gone on without intermission for many thousands of generations." In the case of snakes, at any rate, the poison fangs of so many species seem sufficient explanation of the fear which they inspire. In connection with this subject, Dr. Robinson suggests that the hissing note of the young of most animals nesting in holes in trees—such as owls, wild-cats, bats, and woodpeckers—is to be regarded as "mimicking" the well-known warning sound of the serpent. A point of considerable interest

in the chapter on the cat is the surmise that the markings of "Tabby" and of some of her wild modern relations, such as the Ocelot, are mimetic of the pattern on the back of a snake, the resemblance being specially striking when the animal lies curled up, asleep, and open to the attacks of large birds of prey.

In the chapter on Cattle, Dr. Robinson suggests that our milch cows were rendered serviceable by the forest-haunting habits of the old wild cattle, whose females hid their calves in thickets while they went in search of food, the milk therefore accumulating during the absence of the mother. The full meal thus provided for the calf is contrasted with the small amount of milk taken at short intervals by the foal or the lamb that follows its mother closely and constantly. The cow's habit of holding the head low is another habit of a forest species, used to peer beneath the boughs of trees, and contrasts with the erect bearing of the horse whose ancestors had to scan the horizon of the open plain. In the Sheep and the Goat we have domesticated two evidently mountain species with widely different effect on the animals themselves. For while the sheep seems to have become so utterly dependent on human care that the whole domestic race would die out were that care withdrawn, the goat, like most of our animal comrades, is readily able to revert to its independent life should the partnership with man be dissolved. The Pig, like the ox, was primitively a forester. The tendency to fatten, so highly esteemed in the domestic race, is traced to the need of the wild swine to make the best possible use of their autumnal feast of beech-nuts in preparation for the winter sleep.

It is somewhat surprising to find, in the closing chapter, that the explanation of the conspicuous white tail-markings of rabbits and certain deer, as signals to guide the flock to a place of safety, is put forward as an original theory. The meaning and value of such "recognition marks" was brought out several years ago by the veteran naturalist, Dr. A. Russell Wallace, in his well-known work on "Darwinism;" a book which any writer on animal evolution should surely know.

The author states in the preface that his book is founded on various articles which he has contributed to magazines and reviews, and that though these articles have been entirely re-written, he has thought it well to retain their "somewhat easy and colloquial tone." Occasionally the tone strikes the reader as decidedly easy and colloquial. "I may just as well hold my jaw" in the donkey's imaginary soliloquy is too suggestive of the costermonger. A word of praise is due to Mr. S. F. Dadd for the excellent illustrations which adorn the volume.

G. H. C.

CHARLES CARDALE BABINGTON.

Memorials, Journal, and Botanical Correspondence of Charles Cardale Babington, M.A., F.R.S., &c., &c. ; Svo, pp. xciv + 474 ; Cambridge : Macmillan and Bowes, 1897.

This is the record of a busy life, by which British botany benefited to a very considerable degree. The book presents a somewhat heterogeneous collection of memorials of Professor Babington—a memoir by Prof. Mayor; “reminiscences” by Rev. J. A. Babington and H. R. Francis, Prof. Cowell, and Mrs. Batty; letters of sympathy, resolutions, and notices in journals and Proceedings of Societies, consequent on the botanist's death; a letter by Babington on Irish distress; a paper on *Rubi* by J. E. Bagnall; a reprint from the *Journal of Botany* of the Introduction to Babington's unfinished “Revision of British *Rubi*”; a précis of his action with regard to the Sunday opening of the Cambridge Botanic Garden; and sundry extracts from poems by various hands. Next we have Prof. Babington's Journal, a brief record of every day events from 1825 till 1891, strongly tinged with botany, occupying 270 pages; on this follow 174 pages of Correspondence, letters written to British botanists, and relating to British plants, between the years 1834 and 1894. A bibliography of his scientific papers comes next, reprinted from the Royal Society's Catalogue, and from the Cambridge Antiquarian Society's Index; this is a goodly list, embracing 186 entries. Finally there is an index to “Journal and Correspondence,” and a separate index to “Memorials.”

Such a mass of material is here collected that it is difficult to get a grasp of the book as a whole, and one's first thought on looking through it is that much might have been omitted without detracting from the interest of the work, and without injustice to the memory of the man. We do not need to be told that the Cambridge Antiquarian and Philosophical Societies, for instance, passed formal resolutions of condolence on his death, which were formally transmitted by their Secretaries to the representatives of the deceased; and the printing in full of such letters appears superfluous. The Journal which he kept so long and so faithfully, filled as it is with notes of plants that he found and of people whom he met, appeals to us more strongly; yet we do not learn anything from such entries as “*April* 12 [1834]. This day it snowed more than it had done during the last winter.” “*July* 13 [1834]. *Sunday*. Went to Church at Meole.” “*Jan.* 21 [1837]. Degree Day.” “*Dec.* 7 [1883]. Barometer 30.52.” “*April* 12 [1889]. Dr. Kennedy's funeral.” In the letters, likewise, a little judicious selection would have added force to Babington's correspondence, and might have prevented the appearance of such pointless items as the following:—“Dear Sir,—Will you kindly tell me the true name of this *Chara*? I am asked the name, and cannot tell quite certainly.—Yours truly, Charles C. Babington.”

However, in spite of its diffuseness, we have dipped into this volume—it is not the kind of book which one can read straight through—with deep interest. To readers of the *Irish Naturalist*, the part of Babington's Journal which will arouse most attention is the brief notes in which he records his several visits to Ireland. The first of these took place in 1835, when he was 27 years of age, and his first excursion was to Killiney Hill in company with J. T. Mackay. Thence he went to Lough Derg and Connemara, where he found the garlic which his friend Borrer named in his honour *Allium Babingtonii*, and he travelled *via* Limerick to Killarney and Cork. He visited Ireland again in the following year, botanizing in Wicklow, Mayo, and Galway. A third visit to the West was made in 1840, his route extending from Westport to Londonderry. In 1841 he landed at Cork, and spent three weeks in the South-west. Two years later the British Association met at Cork. Babington attended the meeting, and subsequently spent three weeks in the counties of Cork and Kerry. He was again in Ireland in 1852, when the British Association met at Belfast, and with Newbould spent ten days in botanizing round the coast of Antrim. In 1858 we find him at Waterford, Killarney, Dublin, and Drogheda. His last visit to Ireland was in 1873, when a week was spent in Dublin, and three weeks at Roundstone, much time being devoted to visiting schools and churches. These portions of the Journal are full of notes of plants, and impressions of Irish botany, and form interesting reading to the local naturalist.

The Letters are, like the Journal, crowded with references to critical plants, and with discussions on them. Among them we note many addressed to A. G. More, who was a very old friend and correspondent of Babington's.

The two indexes are lengthy, yet on looking under "Ireland" and "Connemara" we find no reference to his visits to this country, nor on trying under "More" are we directed where to turn in order to consult the letters written to that botanist. These things have to be picked out of the body of the book.

R. LL. P.

OBITUARY.

DR. G. M. O'CONNOR.

We have to record the death of Dr. G. M. O'Connor, of Ballycastle, Co. Antrim, which took place on November 20th. Dr. O'Connor was a man of genial and energetic mind, and having a strong taste for natural history, he proved an invaluable ally to naturalists who visited the interesting district of North Antrim. He had a good knowledge of the local flora, and his garden was well known to most of the horticultural members of our Field Clubs.

THE WRYNECK IN IRELAND.

BY LENA GYLES.

AMONGST the birds which have been added to the Irish avifauna during the last twenty years, *Lynx torquilla*, the Wryneck, is conspicuous.

Up to the autumn of 1877 it was common in England, rare in Scotland, and unrecorded from Ireland; since then it has occurred five times in the latter country.

The first specimen is in the Museum of Science and Art, Dublin. It was shot on the 5th of October, 1877, near Dunmore, Co. Waterford, by Mr. Ernest Jacob, by whom it was presented to the Museum.

In the autumn of 1878 the second Irish specimen was shot on the island of Rathlin O'Birne, two miles off the west coast of Donegal, by the light-keepers—Mr. John Tottenham, and Mr. George Gillespie.

Mr. Gillespie, writing to Mr. Barrington in 1892 says: "I think it was in October, 1878, that the Wryneck was shot on Rathlin O'Birne. I first saw it on the island about 1 p.m., went home for my gun and returned, accompanied by John Tottenham. The bird was near the same place and pitched close to where Tottenham was, and he fired and shot it. He stuffed it, but I find on inquiry that it went to loss. We did not know it was a Wryneck then, but the principal keeper got one on North Arran and sent it to you, and it was the same kind; I knew it when I saw it."

Eight years later—in 1886—the third specimen occurred, and is recorded in the "Report on the Migration of Birds on the Irish Coast" (p. 39), for that year as follows:—"Aran Island North Light-house; October 6th, 2.30 a.m., wind very light, S.W., blue sky, cloudy, misty. One killed striking lantern. [Received in flesh a male Wryneck, very fat.]" This bird was forwarded by Mr. Thomas Fortune, principal light-keeper on Aran Island North—a light-station nine miles from shore off the coast of Galway—and is now in Mr. Barrington's collection.

After an interval of nine years a fourth Irish specimen was added to the list. An adult Wryneck was shot on the 31st of May, 1895, at Ballycurry, Ashford, Co. Wicklow, by one of Colonel Tottenham's game-keepers. It was set up by Mr. Williams of Dublin, who received it in the flesh from Colonel Tottenham, and it is now at Ballycurry.

In the following year—on the 8th of September, 1896, an adult Wryneck in beautiful plumage was sent to Mr. Barrington from Rockabill Light-house, five miles off the coast of Dublin. Mr. H. Kelly, light-keeper, in the letter which accompanied this specimen, says that it "was killed against the Light on the 5th instant, east wind, hazy at the time." This specimen is also at Fassaroe.

According to Saunders and others, the Wryneck is a summer visitor to England and the Continent, going north as far as Scandinavia and Finland, and Archangel in Russia. It winters in Africa, Burma, and India.

Its other common English names are "Cuckoo's-mate," "Cuckoo's messenger," and "Cuckoo's-leader," for the reason that it usually precedes the Cuckoo by a few days; and "Snake-bird," partly from its curious habit of elongating and turning its neck, and partly from the hissing sound it makes when disturbed on its nest. Dresser says (vol. v., p. 107, "Birds of Europe") that "when taken in the hand it contorts its body, and makes such hideous grimaces, and hisses so loudly, as to frighten anyone unacquainted with the bird, and its curious habits. It will stretch out its neck to the fullest extent and turn its head till the beak is now directed forward and now backward as if the head were placed the wrong way."

It is an insect-eating bird, ants and their eggs being its chief and favourite food. In plumage it more closely resembles the Nightjar than any other British bird.

The chequer-like markings on the primaries, and the curious mingling of soft ash-grey, brown, black, and yellow of other parts of its plumage—closely resembling the bloom on some moths' wings—are very beautiful. Its plumage is an instance of protective colouration, rendering the bird more or less difficult to distinguish from the lichen-covered bark of trees.

The Wryneck, like the British woodpeckers and cuckoos, has two toes before and two behind. It has a very long glutinous and slender tongue which it can thrust out to a great length.

Authorities differ on describing its note, which is said by Seebohm to "bear some resemblance to the word *vite* uttered several times in succession." Dresser likens its note to the syllables "*hvesd hveed hveed*," Saunders gives it as "*qui qui qui* or *pay pay pay*," Newton as "*que que que*," and Harting as "*dear dear dear*."

Seebohm says ("History of British Birds," vol. ii., p. 375): "The Wryneck is one of those birds that by a little judicious management may be induced to lay an extraordinary number of eggs in a single season. Like the Starling, the hen bird will continue to lay after her eggs are removed, and many instances are on record of great numbers of eggs having been taken from a single nest. In 1872 Mr. Frank Norgate took forty-two eggs from one nest of this bird in an old stump. In 1873 the female again laid forty-two eggs; but in 1874 her reproductive powers were apparently exhausted, only one egg was laid, and in 1875 the place was deserted."

Northumberland-road, Dublin.

NOTES.

ZOOLOGY.

INSECTS.

The Male of *Vespa austriaca* Panz.

In an article in the *Irish Naturalist*, November, 1897, vol. vi., p. 285, Mr. H. K. G. Cuthbert says "No collector of Aculeate Hymenoptera in Great Britain or Ireland has yet met with the male of *V. arborea*, although the males of all our other indigenous *Vespe* are well known." If Mr. Cuthbert will kindly refer to the *Entomologist's Monthly Magazine*, September, 1896 (2), vol. vii., p. 212, he will see that an example of the male has been met with by myself in this district; and its specific identity was confirmed by Mr. Edward Saunders.

Bloxworth, Dorset.

O. PICKARD CAMBRIDGE.

*FISHES.***Extraordinary Run of Herrings in the Moy Estuary.**

Early last month the most extraordinary catch of herrings ever known on this part of the coast, was taken by the fishermen in this estuary. Nearly every autumn large schools of Herrings visit Killala Bay, to deposit their spawn, and after spawning occasionally enter the estuary, remaining inside for a night or two, if the weather keeps calm. On this occasion the multitudes of Herrings that came into the estuary must have been enormous, as the catch of the various boats proved, nearly all loading their boats at the first haul, then, coming ashore delivered their fish, and as the fishing-ground was close by, went out again, and had a second haul before running, which is a most unusual occurrence in Herring-fishing. One yawl with a crew of six men, and train of six nets, on the first night of the fishing, took 7,500 in their first haul, then coming ashore and delivering their fish went out again, and shortening their nets, got 6,000 more when they hauled them between 5 and 6 o'clock next morning. Nearly all the boats belonging to the estuary were successful in making two hauls during that first night's fishing, which is a most unusual occurrence, and what was stranger still, and almost unheard of was, that in several instances Herrings entered the nets in the daytime. One man told me that he had fish in his nets a little after 4 p.m., while Mr. Kirkwood, of Bartragh, said that three of his workmen went out about 3 p.m. in a small punt with only two nets, which they shot while the sun was shining brightly, and in a short time took into their boat 2,000 (a remarkable haul for two nets). They then came ashore, delivered their fish, went out again, and were nearly as successful in their second haul: and bringing their fish ashore, went out for the third time, and had a fine take before morning.

The weather remaining calm, the Herrings stayed for several days, and the large takes so glutted the markets, that they were sold in the town of Ballina, as low as 9*d.* and 1*s.* per hundred. This great run of fish appeared almost simultaneously on several parts of the coast. At Aughriss Head, on the Sligo coast, the quantities taken were so great, that Herrings were hawked in carts about the country selling at 8*d.* per hundred. While in Clew Bay, on the Mayo coast, the takes were so heavy, that Herrings were sold in Westport at 5*d.* and 6*d.* per hundred. After the schools left the estuary, they disappeared, not remaining any time in the bay, but were replaced by others, and some have been taken nearly every week since, but not in such large numbers. The last schools ran far up the estuary, some fish being caught off the Shipping Quay, five miles from the bay, and only one mile from the town of Ballina. Some fish are in the estuary still, for to-day, when down at Bartragh in my shooting punt, I saw Herrings rising all about the channel.

BIRDS.

Fulmar and Manx Shearwater at Londonderry.

About 11th September last a Fulmar (*Fulmaris glacialis*) was caught in the Foyle close to the City Quay. It was swimming in the river and was captured by a young man from a boat. It had no signs of being wounded. About the same time two Manx Shearwaters (*Puffinus anglicus*) were found in the city, one in a yard, and the other in a small reservoir which supplies the distillery. Both species were stuffed by Mr. Edward M'Court and examined by me.

Londonderry.

D. C. CAMPBELL.

MAMMALS.

The Wild Horse (*Equus caballus*) in Ireland.

Major Moore, of Killashee, near Naas (Co. Kildare), recently sent me for identification the occipital portion of a skull and the posterior part (as far as the postorbital process of the frontal bone) of another.

Both of these evidently belonged to horses, but to specimens of very small dimensions—certainly not larger than an ass. The skulls were discovered, when making a drain in Major Moore's property, resting on the gravel beneath the bog. The remains therefore probably belong to wild horses, which are known to have inhabited Ireland as contemporaries of the Irish Elk.

In the more complete skull the height of the occipital crest measured 2.3 inches, and the distances between the two zygomatic arches in a straight line 7.5 inches. It should be noted that all the remains of the feral horse hitherto discovered in Ireland, viz., in Shandon Cave and many Pleistocene deposits, point to the fact that it was of small stature. I may mention that these remains have been kindly presented to the Dublin Science and Art Museum by Major Moore.

Dublin.

R. F. SCHARFF.

BOTANY.

PHANEROGAMS.

“Open-Air Studies in Botany.”

In the November number of the *Irish Naturalist* Prof. Hartog censures me for preferring ‘calices’ to ‘calyxes’ as the plural of calyx (which I admit should be spelt ‘calix’), but even if the former spelling were etymologically incorrect, which it is not, it would be justified by long and universal use, and by analogy with such plurals as indices, vortices, appendices and the like. How would Mr. Hartog spell *calycine*, *Calyciflora*, and other allied words derived from *calyx*?

In the same communication Prof. Hartog assumes, rather unwarrantably, that the facts mentioned in my remarks on *Lathræa* were obtained from a paper by Groom which was not published until after Mr. Praeger's book had appeared. Surely Mr. Hartog is aware that the supposed carnivorous habits of *Lathræa* were disproved many years ago? As far back as 1876 Cohn—admittedly working under the impression that the leaves were animal-traps—examined and dissected large numbers of specimens of *Lathræa* at intervals during the summer, but excepting in rare instances found no animals or their remains in the cavities. He therefore concludes that his first impression was erroneous. Cohn also records the significant fact that "these cavities in the leaves are filled with a liquid which must be regarded as the secretion of the glands" (*Jahresbericht des Schlesischen Gesellschaft*, 1876: Breslau, 1877, pp. 113 et seq.).

Two years later Krause ("Beiträge zur Anatomie der Vegetations-Organen von *Lathræa Squamaria*, L."; Breslau, 1879) adduces convincing arguments against the view that the plant is carnivorous, and concludes a summary of his investigations with the emphatic assertion "*Lathræa Squamaria* is not an insectivorous plant."

Scherffel, in his exhaustive article on *Lathræa* (*Mittheilungen aus dem Botanischen Institute zu Graz*: Jena, 1888, Heft 2, pp. 187-211) is equally emphatic in his opinion that the theory of Cohn and Krause, as opposed to that of Kerner and Wettstein, is the correct one. After careful, prolonged, and repeated investigations of the leaf-cavities he only very exceptionally found animals or their remains in them; he therefore agrees with Cohn and Krause that "the cavities in the subterranean leaves of *Lathræa* have nothing to do with the capture of animals."

Finally Hovelacque (*Recherches sur L'Appareil Végétatif des Bignoniacées, Rhinanthacées, Orobanchées et Utriculariées*; Paris, 1888, pp. 499-552), after a full account of all the previously published work on this subject, affirms that "the cavities appear to be rather secretory organs, or even excretory, than absorptive; there is nothing which indicates that they subserve the latter function (*i.e.* absorption); they could, moreover, only act as traps in so far as the secretion which they produce is attractive to insects."

I think enough has now been said to justify my distrust of Kerner's theory. In my review I mentioned Groom—perhaps inadvisedly—because his work so thoroughly establishes the conclusions arrived at by the authors quoted above. *These* authors are "the others" to whom I referred; not Haberlandt and Goebel as Prof. Hartog states, and whose papers I have not yet seen.

In conclusion I should like to say that further acquaintance with Mr. Praeger's delightful book has only intensified the favourable impression that its first perusal made upon me. I regard it as quite the best book that could be put into the hands of all lovers of wild-flowers.

The Cork Groundsels.

Having been for some years past much interested in the history of the presumed hybrid *Senecio*, which occurs in this district, I was pleased to see the note in last month's *Irish Naturalist*, by Mr. F. W. Burbidge, especially his opinion, after seeing the plant *in situ*, that it "has resulted from the hybridising of *S. squalidus* with *S. vulgaris*," a point on which doubt has been cast by English as well as Irish botanists.

First, I believe, collected and distributed by Isaac Carroll, who apparently had no doubt about its being a hybrid, it was recorded by Moore and More in the *Cybele Hibernica* as "may be a hybrid" but subsequently, in "Additions to the Flora of Ireland," More states that "the supposed hybrid . . . proves to be the rare variety of *S. vulgaris* with ligulate florets, which has also been found in Donegal."

Specimens distributed through the Bot. Exch. Club from 1875 to 1880 have been variously referred to in Reports of that Club as *S. vulgaris* var. *hibernica*, *S. vernalis*, and *S. crassifolius*, chiefly on the authority of Syme, who seems to have doubted its hybrid origin. Dr. Focke in his work on hybrids has accepted it as *S. vulgaris* \times *S. squalidus*.

How so many names came to be applied is not easy to see, but they may be due to the fact that *S. vulgaris* var. *radiatus* and the hybrid, which in some states closely resemble one another, both occur in Cork, the latter being confined to places where *S. squalidus* is abundant, while the former is plentiful and widely distributed throughout the county, occurring on all the railways, many roadsides, waste places, &c., reaching south to Skibbereen and Baltimore, and on all sides far beyond the range of *S. squalidus*. The hybrid is a variable plant, the commoner form being weak, with slender, rather succulent stems and branches, the rarer one is upright, has a more fibrous stem, fleshy leaves and flowers approaching those of *S. squalidus* in appearance.

The variety *radiatus* is usually found in company with the type of *S. vulgaris*, but in some places, as at Passage, is almost the only form to be seen.

Information as to the occurrence or absence of these intermediate forms in the south of Europe and other places where *S. squalidus* and *S. vulgaris* grow together would be most interesting and desirable.

As an instance of an exotic establishing itself in a comparatively short time, few plants will bear comparison with the spread of *S. squalidus*, which is now the most abundant and brightest looking weed around Cork and several of the neighbouring towns. It is in full bloom in May with another burst in autumn, and individuals may be found flowering at all seasons. Its leaves are usually pinnatifid with irregular linear segments, but a form occurs at Cork and Queenstown in which they are lanceolate, entire or slightly serrate.

PROCEEDINGS OF IRISH SOCIETIES.

ROYAL ZOOLOGICAL SOCIETY.

Recent gifts include a Parrot from Mr. H. D. Harris, four Pea-fowl from Dr. H. C. Tweedy, an Indian Leopard from Mrs. M. Stuart, a Mona Monkey from Mr. J. L. D. Meares. A Llama and two Puina cubs have been born in the Gardens. A Jackass Penguin, a Bonnet Monkey, a Wapiti Deer, two Golden Paradoxures, a Porcupine, and a Goliath Heron have been bought.

6,000 persons visited the Gardens during November.

DUBLIN MICROSCOPICAL CLUB.

NOVEMBER 18.—The Club met at the house of Mr. G. H. CARPENTER who showed adult and larval specimens of a new genus of marine bug allied to *Halobates* which he had received from Mr. J. E. Duerden, by whom they had been collected in Kingston Harbour, Jamaica.

PROF. G. COLE showed a section of gneissoid rock from the rock west of Carrickmore, Co. Tyrone, formed by intrusion of granite veins into a diorite. The latter is converted locally into a granular hornblende aphanite, flakes of which are taken off and partly absorbed by the invading granite. The specimen was collected for comparison with the true gneisses of the moorland to the north of Carrickmore. In Sultanbane a "gneiss" occurs, the true nature of which is still obscure, and which may prove to result from parallel intrusions like the small example of Carrickmore.

Mr. GREENWOOD PIM showed a remarkable fungus which almost entirely covered the surface of leaves of Cherry Laurel collected last year at Cappagh, Co. Waterford, by Prof. Johnson. The plant consisted of (apparently) conceptacles, each furnished with one or more slender necks, strongly resembling some form of *Gnomonia*, but careful and repeated search failed to show any spores, so that identification was very difficult. Mr. Pim has since been informed by Mr. G. Massee that he considers the plant to be *G. erythrostoma*, Auersw., not previously recorded from the British Isles. It causes much injury to cherry trees in Germany.

Mr. Pim also showed *Nectria sanguinea* from a Beech trunk at Avondale, Co. Wicklow, collected on the recent Dublin Field Club excursion.

PROF. T. JOHNSON showed a preparation and a specimen of a truffle, *Tuber aestivum*, received for identification from Borrisokane, Co. Tipperary. This fungus fruit was found in large numbers under beech trees. Truffles have been gathered for years for culinary purposes under Cherry Laurels on Lord Iveagh's property in Co. Dublin.

Mr. MCARDLE exhibited specimens of *Frullania tamarisci*, L. var. *atrovirens*, Carrington, which he found growing on rocks within the spray of Torc Waterfall, Killarney, in September last, when collecting for the Flora and Fauna Committee of the Royal Irish Academy. This curious form of the brightly-coloured type-plant, which was also exhibited, is of an indigo green colour, the leaves are ovate, remarkably apiculate and inflexed at the apex.

BELFAST NATURALISTS' FIELD CLUB.

NOVEMBER 10. CONVERSAZIONE.—An interesting conversazione was held in the Free Library, which was kindly granted by the Library Committee of the Corporation for that purpose. This meeting was under the combined auspices of the Belfast Naturalists' Field Club, the Belfast Art Society, and the Ulster Amateur Photographic Society. The doors were opened to the members at 6.30. Tea was served in the room devoted to the Grainger Collection and in the Lending Library. Afterwards the members were directed to the exhibitions, which were well arranged in the Reference Library and Art Galleries. On the tables of the Reference Library were laid out the exhibits of the Field Club. These illustrated the work done or objects collected during the season by the members in the various branches of science and archæology. In the Microscopic Section the exhibitors were as follows:—Miss M. K. Andrews, rock sections and specimens of Mourne Mountain granite; Wm. Gray, botanical preparations, recent and fossil; Wm. Hanna, M.B., radiolaria and sponges; W. S. McKee, freshwater organisms; Joseph Wright, F.G.S., foraminifera; whilst the various organisms which give rise to typhoid and cholera were exhibited by Lorrain Smyth, M.D.; W. D. Donnan, M.D.; Cecil Shaw, M.D.; and E. Coey Bigger, M.D. Geology was represented by exhibits by Miss S. M. Thompson, rocks recently collected in Galway, H. J. Seymour, B.A., water-colour drawings of Benevenagh and Fair Head made by the late G. V. DuNoyer; Robert Bell, zeolites from Squire's Hill and Chalk fossils; W. J. Fennell, fossil plant-remains from Dungannon; J. St. J. Phillips, micro-slide preparations and the rock-sectioning machine, kindly presented to the Club by Messrs. Combe, Barbour, and Combe. In the Botanical Section exhibits were made by Rev. C. H. Waddell of an educational series of plants and specimens collected by members of the Club during the past session. J. H. Davies showed an immature unnamed Crane's-bill, whilst Mr. F. W. Burbridge, F.L.S., exhibited *Azolla* in fruit, and odorous leaves from the Trinity College Gardens, Dublin. One of the most interesting exhibits, perhaps, was the series of butterflies recently collected in the United States by G. Donaldson, a member of the B.N.F.C. R. J. Welch exhibited a large variety of land and fresh-water shells, taken in various parts of Ireland during the past year; whilst G. P. Farran, of the Dublin Club, exhibited a number of shells recently collected in Westmeath and Sligo. John Hamilton exhibited living reptiles which attracted much attention. A good exhibit of old Ulster candlesticks and rushlights was made by Robert May and F. J. Bigger; an ornamental wrought-iron candlestick from Annalong being much admired. The pictures of the Art Society, which were hung in the galleries, added much to the enjoyment of the evening. In the corridor, the Photographic Society made an exhibit of a large collection of prints sent in for the summer competitions. These showed great artistic refinement and technical skill on the part of the exhibitors. A popular exhibit was that of "Ives Kromskop" by J. Jazars, who had a number of slides showing recent advances in photography in natural colours; whilst R. Welch was able to show on the lantern

screen two slides by Dr. Joly's process. At 9.30 a lantern exhibit was given, when archaeology, geology, botany, and bacteriology, were represented and explained in a series of slides.

BOTANICAL SECTION. NOVEMBER 20.—The monthly meeting of the section was held, when the *Umbelliferae* were discussed. It is intended to study the British natural orders, beginning at the point where they were suspended last session.

DUBLIN NATURALISTS' FIELD CLUB.

NOVEMBER 9.—The first business meeting of this Club for the winter session was held in the Royal Irish Academy Rooms, the chair being taken by the President (Prof. G. A. J. COLE, F.G.S.) A large number of members and their friends assembled.

Mr. G. COFFEY, M.R.I.A., Curator of the Archæological Collections in the Science and Art Museum, read a paper entitled, "A Prehistoric Field Club." Mr. Coffey showed a series of lantern-slides illustrating the view of M. Houssay, that certain forms of decoration of Mycenæ pottery represented the South European water-plant, *Vallisneria spiralis*, and indicated a knowledge of the relationship of the male and female flowers of the species. Another series of slides illustrated the Barnacle Goose legend which, it was contended, could be recognised in Mycenæ pottery. An interesting discussion, in which Prof. Cole, T. Greene, LL.B., Rev. Maxwell Close, F.G.S., and Prof. Haddon took part, followed. The thanks of the meeting were accorded to Mr. Coffey for his interesting paper.

Prof. HADDON, D.Sc., next gave an account as the Club Delegate of the meetings of the Corresponding Societies of the British Association for the Advancement of Science at Toronto last August. He stated that there were two meetings of the Corresponding Societies' Committee, but he was able to be present at the last only. At the Conference in Liverpool last year, the question of federation amongst the local Natural History Societies of Great Britain was discussed, and the Corresponding Societies' Committee was asked to report thereon; their Report was read at the first meeting of the Committee in Toronto. A circular had been sent to the sixty-six Corresponding Societies, and to fifty-eight others. After two applications only thirty-four replies were received, of which nine already belonged to Unions, nine were generally unfavourable to Unions, and nine were unfavourable in their own cases. The Report expressed some disappointment at the slowness of the interest manifested in federation, but it is to be hoped that the effect of the enquiry will be to direct attention to the advantages of this course. A discussion followed the reading of the Report.

(In Ireland we have, thanks to the efforts of Mr. Praeger, a very effective system of federation).

Prof. Herdman requested delegates to urge their Societies to give attention to the investigation of the causes of the colouration of green oysters. Mr. Hoyle urged the importance of the accurate use of generic and specific names in the publications of Local Societies.

At the second meeting, Prof. Miall, the President of Section D. (Zoology), warmly recommended the study of life-histories, as follows :—

“ It may be thought that this study of life-histories is not specially suited for the amateurs who compose a large part of the Local Societies. It cannot be denied that the work is hard and has special difficulties connected with it, for to prosecute it in an adequate manner involves some knowledge of anatomy and physiology, and also some acquaintance with the problems of development as well as a considerable power of observation and much enthusiasm. These certainly appear to be large demands, but we cannot expect to get any scientific results of real importance which are not procured at the cost of much labour. The things which lie upon the surface and are easily got at are, as a rule, in the present development of science, not of very great value. If we aim at achieving real scientific results we must expect to have to pay for them both with our time and with our labour.

“ If there be anyone here who may think of devoting himself to the study of life-histories, I need hardly say that he has an abundant choice of subjects, even in so narrow and so well-worked a country as England. I will ask your permission to take a run over that department of natural history with which I have of late years occupied myself. I refer to the study of insects. Anyone who has occupied himself with promoting the scientific study of insects, will, I think, agree with me when I say that almost everything still remains to be done. The insects have been collected and classified, but with rare exceptions their life-histories are still unknown. Let me instance the Lepidoptera and Coleoptera, for the simple reason that they are better known than the rest. We know well their external forms or shapes; the stages of many have been recorded and drawn; and along with these external features we know something about their food-plants, mode of life, and so on; but how their mode of life and peculiarities of structure are interrelated we know not. I think it is a reproach to the naturalists of our generation that they are content to leave the higher knowledge of insects and devote their whole attention to mechanical details.

“ As a type of what I am dealing with, let me refer you to the common Diptera. I do not think that more than a dozen out of the vast number of these insects have been thoroughly investigated. It seems that 200 or 300 have been studied, at least superficially, and of these we know more or less; but they are among many thousands of which it seems that we are practically in ignorance. What, then, can we expect to learn about such a subject as this unless we are prepared to meet difficulties and incur the cost of time and labour? Here is a vast and important field inviting the attention of naturalists; and when we consider the number of enthusiastic naturalists scattered, not only over our own, but also over every other country, we might surely expect most important results if this business were taken seriously in hand.

“ As to the methods of inquiry, let me suppose that any one of you intends to take up live natural history. I should recommend him to study the things which are commonly found round about him; to procure

those animals which he is accustomed to see again and again every day, and which he will not have to go a mile or two to procure, say from the nearest stream if not too far away. Then as to the helps which exist, there is a literature of this subject, but one difficulty is that most, if not all, of this literature is written in a foreign language.

"To incite beginners to undertake this special work of the study of life-histories, I think that something might be done if we were to put before them a single example of a common insect worked out with some degree of detail. If that were done in England it would get over the difficulty felt by naturalists who have not made acquaintance with a foreign language. We have hardly any examples of life-histories worked out and presented to us in a thoroughly acceptable form. This difficulty seems to me so considerable that I am now trying to draw up such a life-history of the *Chironomus*, or blood-worm, which is everywhere accessible. It is one of the most instructive insects known to naturalists, and in twelve months I hope to have its life-history ready for the use of the student.¹

"But it is not enough merely to have a book put into the hands of students; they must know how the actual work of observation is done. It might be possible to pick up from among the members of the Corresponding Societies in various parts of England an enthusiastic party of young men to show them how particular things are done. For instance, how to capture certain kinds of insects, how to study them anatomically, how to disclose the embryonic development and inner changes which accompany metamorphosis. Let me suppose that out of the members of the local societies situated within convenient distance of the city of Leeds, where I have my laboratory, twelve should agree to assemble some time next summer, say in July, and take up the work which I have proposed, each to bring his own microscope, if he has one. I will then undertake to go through a quite elementary course of training on the *Chironomus*, its life-history and its development. I think I can undertake to initiate such a party of investigators into a useful method of carrying on the study of life-histories, and I think they will carry home with them, from a short course of study, a determination to pursue the work. We could then try the experiment in another district. London for instance; and I should also be glad to do anything by way of correspondence to further this study.

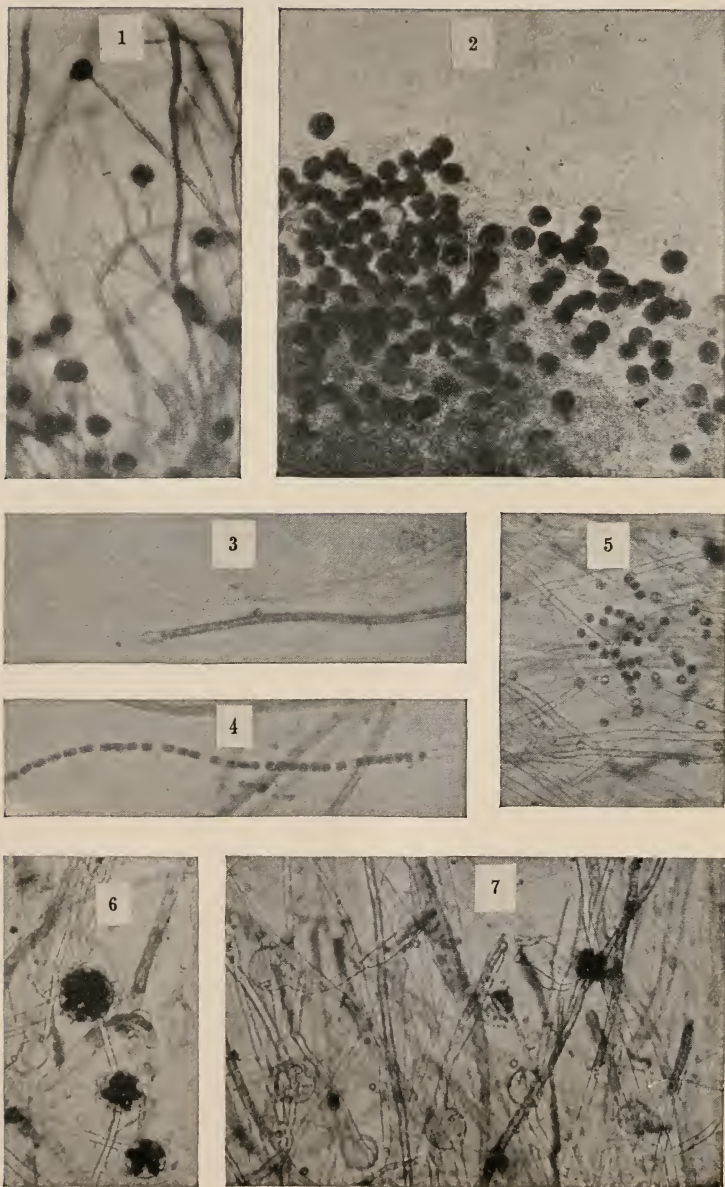
"If we should succeed in carrying out this plan it might lead to a revival of the study of natural history in our country. Each student might turn into a centre of infection when he went home, and spread the virus through his brother naturalists."

¹ It will be seen that Mr. Denis Pack-Beresford, an amateur naturalist in the south of Ireland, has contributed to the current number some interesting notes on the habit of the larva of *Chironomus* (pp. 4-6.)

Dr. H. M. Ami, of Ottawa, read a paper "On the state of some of the principal Museums of Canada and Newfoundland," in which he detailed the more important objects and collections in the several Museums. This led to a short discussion, the paper will be printed *in extenso* in the Report of the Association.

As representing Section H. (Anthropology), Prof. Haddon was next called upon to offer some suggestions, and speaking on behalf of the Ethnographic Survey Committee, he said that it seemed to him that, while the local Societies properly spend a great deal of time on natural history, they neglect the study of man, who is an animal, and deserves to be studied as thoroughly as the lower animals. Local Societies might well undertake a survey of the ethnography of their own districts. He would be sorry to draw students away from the study of other branches of natural history, but he thought that there must be many members of the local societies who did not study the fauna, the flora, or the geology of their locality, but would be interested in ethnographical work of some kind. There are several anthropological investigations which could be attempted almost anywhere. Besides observations on the colour of the hair and eyes, the stature, the shape of the head, and other physical characters, the customs and beliefs of the people and their folk-lore should be studied. As examples, mention need only be made of local customs on particular days, or the numerous and very interesting singing games of children, such as "Jenny Jo," "Dukes-a-riding," "Green Gravel," and the like. These might seem to be trifling matters, but many of these customs and games are the only records we have left to us of the religious rites and social customs of our ancestors, and therefore they are by no means to be despised. It would also be advisable for the local scientific and photographic Societies to interest their members in depicting the geology, natural history, and ethnology of their district, the latter especially. Many opportunities for the study of British anthropology are vanishing or becoming modified just as surely as are corresponding details in the islands of the Pacific.

Several exhibits were shown—Mr. R. L. L. PRAEGER, Vice-President, showed a fasciated Carline Thistle from the Murrough of Wicklow, Mr. A. V. JENNINGS, F.L.S., a series of specimens of alpine and other plants, Mr. H. J. SEYMOUR, B.A., a series of Du Noyer's geological drawings belonging to University College, and the Hon. Sec. (Dr. T. JOHNSON), pieces of old and new long lines in which the hooks are made of the thorns of the Blackthorn, and said to be considered by the Essex fishermen better catchers than steel hooks. The Secretary also exhibited specimens illustrating the group of slime fungi or Mycetozoa of which a collection of 100 species had been recently presented by Mr. A. Lister, F.L.S., to the Botanical Collections of the Science and Art Museum. Some of the characteristics of the group were described, and the hope was expressed that some member of the Club would undertake with the help of this collection the examination of the Irish slime fungi of which not more than twenty species were known. Nominations of four candidates for Club membership were read.



FIGS. 1, 2.—*Leptolegnia caudata*, De Bary.

„ 3-7.—*L. bandoniensis*, Swan, sp. nov.

ON THE GENUS LEPTOLEGNIA OF THE SAPROLEGNIACEÆ,

WITH THE DESCRIPTION OF A NEW SPECIES, AND REMARKS
ON A SPECIAL FORM OF CHLAMYDOSPORES.

BY ALLAN P. SWAN, F.L.S.

[Plate 1].

THE Saprolegniaceæ are microscopic plants, which lead aquatic lives. They are of very general distribution; probably there is no natural open water in Ireland in which they are not present. The family, by the latest classification, consists of eleven genera, and more than forty species, all of which are of saprophytic habit.

Their study is somewhat tedious owing to the difficulty in obtaining pure cultivations, and also to the long period which must necessarily elapse—say seven to twelve days—before the life-cycle of any species is sufficiently complete to allow of its certain identification.

Their vegetative organs consist of tube-like filaments with a continuous cavity. These are of two kinds; internal threads, which penetrate the nutrient substance, on which they live, serving as roots, and the external filaments which spring from them and grow outward into the surrounding water. It is on these latter that the organs of fructification are borne, and it is upon them, and the characteristic behaviour of the spores which they contain, that the generic classification is mainly based. When these filaments—which in a sense are like the stalks of the grasses—have attained a good healthy growth, they develop their organs of reproduction, which are of two kinds, sexual and non-sexual.

The non-sexual fruit is developed in an organ called a zoosporangium, and the zoospores which it serves to produce and distribute are the active agents for the rapid reproduction of the species. They are tiny protoplasmic bodies, generally oval in shape, and with few exceptions, actively motile, either when liberated, or at some later period previous to germination; their movement is imparted by cilia, the lashing motion of which is too rapid for observation.

These zoospores in the genera *Saprolegnia*, *Leptolegnia*, *Pythiopsis*, and *Leptomitus* are endowed with two periods of movement, hence are called diplanetic. They generally escape with free movement from the sporangium, to settle down, after about fifteen minutes activity, and encyst to globular shape. The period of this encystment may vary, mainly depending on the presence of food in their vicinity, but they soon awaken again to active life, and seek for a favourable nidus on which to germinate.

In the genera *Achlya*, *Aphanomyces*, and *Apodachlya*, the zoospores have but one period of movement after their escape, hence are called monoplanetic, and the genera *Thraustotheca* and *Dictyuchus* are practically the same, but in the genus *Aplanes* movement is entirely suppressed and the zoospores germinate in situ, without liberation from the sporangium.

The sexual spores, or oospores, are produced in a distinct vessel called an oogonium, and generally appear in the life-cycle of the plant at a later period than the zoospores. By their increased power of resistance to unfavourable conditions, and their greatly prolonged vitality, they are evidently intended to carry reproduction over periods of danger, such as the cold time of winter, or an interval of starvation. Researches on the vitality of these spores¹ show them to be extremely torpid, so much so that their germination in most species has not yet been observed, while the few which have been induced to grow sometimes demand as much as 200 days rest before they can be awakened to life.

The rarer non-sexual chlamydospores are supposed by Humphrey² to fill an intermediate want, as they germinate more readily than the oospores, and by their greater resistance can constitute a resting-stage when compared with a zoosporangium. They are usually vessels of globular shape, often formed in a series, their position being terminal on the bearing filaments. They are not commonly produced, and usually appear at the later stages of vegetation, when conditions may be unfavourable for cultivation owing to other forms of life competing, or to want of nourishment.

¹ De Bary, "Morphologie der Pilze."

² "The Saprolegniaceæ of the United States," 1893.

These chlamydospores, according to Brefeldt, 1887, can produce zoospores direct (which are liberated from a short out-growing tube or from a simple opening), or they can throw out an ordinary filament.

Humphrey, however, draws a distinction by calling the globular, direct zoospore-producing vessels "resting sporangia," whereas true chlamydospores produce their zoospores in a distinct tube formed within an out-growing germ-hypha.

The life-history of the individual species of the different genera is fairly constant under uniform conditions of favourable culture, but it is noticeable that the zoospores may be induced to change their usual life-habits. Thus the diplanetic zoospores of *Saprolegnia* will readily germinate without waiting for a second period of activity, while monoplanetic zoospores will occasionally even germinate within the sporangium.

The genus *Leptolegnia* was founded by De Bary, on a single species which he discovered in 1888 in a German mountain-lake, and it appears to be rare, for its occurrence had not to my knowledge been again noticed, until I lately found it at Bandon, together with a new species of the same genus, which I have called *L. bandoniensis*.

The genera *Leptolegnia* and *Saprolegnia* are allied by their diplanetic zoospores, and also by the renewed development of the zoospores taking place within the emptied zoosporangium, otherwise the two species of *Leptolegnia* have a strong morphological resemblance to the smaller and more delicate genus *Aphanomyces*.

The only description of *Leptolegnia caudata*, De Bary, which I have seen is that contained in Rabenhorst's "Kryptogamenflora" of Dr. A. Fischer, and although this agrees well enough with the plant as found here to leave no doubt of its identity, I have noticed differences worthy of mention.

The very characteristic form of the oogonia described as "Schief-eiförmig" is more noticeable in young than in matured examples, the latter being irregularly globular, or when egg-shaped, blunt, rather than sharp egg-shaped at the smaller end, while practically spherical at the other. In a foot-note (page 346) Dr. Fischer speaks of a plant which he kept in cultivation for some time, and which, although agreeing with De Bary's description of *L. caudata*, yet failed to produce sexual fruit. As my experience shows that *L. caudata* pro-

duces its zoospores sparingly, while giving a far more abundant crop of sexual fruit than any other species of the *Saprolegniaceæ* with which I am acquainted, it is probable that he had another species under observation (see page 82).

In this description Fischer also refers to the zoosporangia as "terminal," which, when compared with the enlarged globular extremities of other genera, is at least misleading, as the zoosporangium is filamentous, and filled with spores for practically its entire length. The shape of the zoospore before liberation is also not mentioned; it is short sausage-shaped, as in *L. bandoniensis*.

On page 315 he mentions of the diplanetic zoospores of *Saprolegnia* and *Leptolegnia*, "sie treten fertig aus dem Sporangium hervor, zerstreuen sich sofort," etc. This is correct only as it refers to *Saprolegnia*; in *Leptolegnia* the zoospores are discharged as above mentioned, sausage-shaped and almost devoid of movement. They take at least half-a-minute before assuming ovoid-swarmers form, their movement at first quite languid, increasing in activity as their metamorphosis goes on.

LEPTOLEGNIA BANDONIENSIS, sp. nov.

I have called this species *L. bandoniensis*, as the morphological peculiarities on which its identity is based are likely to be repeated in other species yet to be found; the particulars of its life-history—as far as I have been able to observe them—are as follows:—

Early vegetation as in *Saprolegnia*. Dense masses of filaments radiate in every direction from the solid nutrient substance on which the cultivation is made. The filaments are sinuous and not much branched; a slightly rounded enlargement is noticeable at their extremities. They measure about 12μ . to 14μ . in diameter, and attain in ordinary room temperature a maximum length of 5 mm., say $\frac{1}{5}$ -inch, in about four days. At this time no sign of sporangial fruit is observable, but branches spring out from the filaments, on which terminal oogonia are produced of globular shape; these branches are unusually long and robust. Antheridial branches arise from neighbouring filaments. They are stout and dark, attaching themselves to the oogonia, sometimes singly, but more frequently two or three to each, and are

always declinous in origin. The oospheres mature rapidly in the oogonium, which is at first densely filled and opaque; by the sixth day they appear mature, and are clearly outlined. They number from five to twenty—usually about ten—are globular in shape, centrically placed, and measure about $20\ \mu$ in diameter; the oogonium is always globular and shows no pitting (fig. 6). The non-sexual zoospores are not produced until the oospores are well developed, that is about the end of the fifth day; their appearing *after* the sexual fruit is remarkable, as in other genera of the family this order is usually reversed. When once zoospore liberation sets in, it soon becomes general, and does not cease till the remaining filaments are all reduced to empty exhausted zoosporangia. These filamentous sporangia are about $14\ \mu$ in diameter and filled with zoospores for their entire length; there is no septum visible. The spores can be traced when at rest into the nutrient substratum, and when moving they can be still more clearly seen as they emerge from it. From these and other observations, I am of opinion that the zoosporangia are joined directly to the root-filaments, the dividing cell-wall, or septum, being hidden within them. The zoospores when mature are of short sausage-shape, about 8×15 , with a clear interval of space between them.

The rounded extremity of the zoosporangium persists, but when the first zoospore escapes it carries with it the end of the cavity-wall which encloses it, and this remains as a narrow beak-like tube, about $8\ \mu$ in diameter, through which the zoospores are all liberated, one at a time, into the surrounding liquid (fig. 3).

Their passage is not too rapid for observation or counting, as the narrow outlet offers some difficulty to their egress, while obliging them to assume a more elongated shape. The liberation may continue five minutes or more, as the last spores come up in single succession between increasing intervals of time, and it is at such moments that I have seen them emerging from the mycelia.

The beak-like extremity extending from the rounded end of the zoosporangium (fig. 3) is characteristic of *Leptolegnia bandoniensis*, and it increases in length with each liberation that takes place through it.

In *L. caudata* the rounded end disappears, being drawn out to a narrower extremity at the moment of spore-liberation.

The spores, when liberated, seem for a few seconds almost devoid of movement. They at once twist over toward a horse-shoe shape, and swing about languidly as though carried by a current. The horse-shoe shape rapidly doubles up until the two ends touch, after which the whole fuses to an ovoid form, and the zoospore moves off freely with increasing movement; this metamorphosis lasts about half-a-minute.

When the zoospores are retarded in their escape from the zoosporangium by an obstruction, they may encyst to globular shape within it, but this only occurs in an exhausted cultivation; for they are, when in favourable growth, followed by an upward stream of fresh protoplasm into the empty sporangium, and this may press them together so closely as to render their definition difficult.

At such time if the outlet be obstructed—by, say, a twist in the sporangium—the spores make their escape at the side, leaving a short beak or papilla which marks their place of exit.

It is not unusual in old cultures to see zoospores of varying shape in the same oogonium (fig. 4), their delicate uncovered condition before encystment causing their form to be controlled mainly by the space surrounding them; on liberation, however, the narrow beak-outlet of the sporangium obliges them all to assume the same elongated form.

Chlamydospores are developed in unusual numbers at the same time as the zoospores. They differ from the usual description, as, though some few are placed terminally, they are for the most part developed as large globular oogonium-like vessels on stout lateral branches.

They germinate readily by throwing out unusually large hyphæ, inside which a filament and terminal clavate zoosporangium are produced, from which actively moving zoospores of ovate form are liberated, until all the material of the chlamydospore is used up. This enclosed form of zoosporangium—so unlike the usual one of the plant—strongly suggests the genus *Saprolegnia*, to which *Leptolegnia* is allied by the diplanetism of its zoospores.

The only allusion I have seen to chlamydospores, at all resembling those which I have described, is made by Humphrey, as occurring in the investigations of Zopf on *Apodachlya pyrifera*; these are described as "sometimes lateral in position and never produced in chains."

On the conditions which determine the production of chlamydospores, and their function, considerable difference of opinion exists. They are not developed on all species, and vary much in form, even on the same plant, while their appearance is also quite uncertain on several species which are known to occasionally produce them. From favourable observation and some previous experience, I am not able to regard the chlamydospores of *L. bandoniensis* as constituting a special form of intermediate resting spore-reproduction, which Humphrey suggests, as their ready germination would not allow them to fill such a want, even supposing the provision were necessary¹.

The chlamydospores of *L. bandoniensis* appeared to me as forms of abnormal vegetation arising from oogonial or sporangial origins, and due to unusual surrounding conditions probably never present in a state of nature. Such forms are comparable with the so-called involution forms of bacteria, which are also produced when the conditions of culture are unfavourable. In the Saprolegniaceæ generally speaking the sexual and non-sexual fruit is produced at different periods with a varying interval of time between them. It is only after the protoplasmic material which goes to build up the zoospores is exhausted, and a time of rest for further nutrition has elapsed, that the sexual oospores are developed. If the interval of time between these periods be well marked (and such as will follow rigid attention to air supply, uniform temperature, and other conditions), chlamydospores are not normally produced, although this period is the very time at which they generally appear.

When, however, the conditions are not favourable, the interval may be so short as to cause an overlap in the sexual

¹ Diplanetic zoospores were found by De Bary ("Morphologie der Pilze," p. 369) to retain their vitality for weeks, while Fischer (Rabenhorst's "Kryptogamen-flora," p. 317) found spores of the Saprolegniaceæ in springtime from lately thawed water, which must have remained torpid for months, and yet promptly germinated.

and non-sexual vegetations by not giving enough time for shutting off the later oogonia or zoosporangia from the supplies (by the growth of their basal walls or septa), and so causing involved vegetation to arise, of intermediate morphology. In my cultivation of *L. bandoniensis* an early oospore production was followed by a vigorous zoospore vegetation, and as a final effort unusual chlamydospores of the most complete form were developed on stout lateral branches. They were of globular shape, and germination took place without delay by the growth of a large germ-hypha, inside which was produced a second filament carrying a terminal clavate sporangium (fig. 7), which liberated as active zoospores all the contained material of the mother-cell.

A few terminal "resting sporangia" of varying shape were also produced, which liberated their zoospores through an opening, as in *Saprolegnia*, or through short germ-like outgrowths.

The non-sexual fruit was produced from the ordinary filamentous zoosporangia, and from the chlamydospores at the same time, and continued until one and all were empty, which occurred on the eighth day of cultivation.

The large globular chlamydospores were produced from oogonial origins, which were developing at the time when sexual vegetation began to fail, and their later changed development was probably induced by their being overtaken by a plasma of changed differentiation, their basal walls being yet unformed. The reason why chlamydospores are usually terminal (sporangial) would thus appear to be due to the non-sexual fruit being generally first produced, whence it may follow that zoospores are developed owing to non-sexual material being enclosed in them. Observers, however, must have noticed in old cultivations of *Saprolegnia ferox*, the rarer development of oospores within a zoosporangium, or close to it, in the filament to which it belonged; in this case the vessel must have been emptied of its earlier plasma by zoospore liberation before the later oospore vegetation set in.

I regard my observations on the life-history of *L. bandoniensis* as being very incomplete. Little is known of the influences which control spore-production in the Saprolegniaceæ, and the reversion of the usual order in *L. bandoniensis*, by which

the sexual fruit preceded zoospore production, to be followed by the unusual chlamydospores which I have described, needs a more thorough study, especially as regards the protoplasmic changes which take place during their development.

I am indebted to my friend, Prof. Hartog, of Queen's College, Cork, for literature and assistance in identification, and tender him my best thanks. Prof. J. E. Humphrey's monograph on the "Saprolegniaceæ of the United States," 1893, has been of great service to me, as it contains, in a condensed form, most of the current literature on the subject, and full descriptions of the commoner species.

DESCRIPTION OF PLATE I.

The illustrations were photographed from life, and are magnified $\frac{7.5}{1}$ in all cases.

Fig. 1. *Leptolegnia caudata*, De Bary, bearing oospores.

Fig. 2. *L. caudata*, old oospores at rest.

Fig. 3. *Leptolegnia bandoniensis*. Emptied zoosporangia, showing beaks with fresh protoplasm moving upward in the lower example.

Fig. 4. *L. bandoniensis*. Non-sexual zoospores of varying shape, imprisoned in their sporangium.

Fig. 5. *L. bandoniensis*. Encysted zoospores fifteen minutes after their liberation, surrounded by empty zoosporangia.

Fig. 6. *L. bandoniensis*. Sexual oospores, enclosed in their globular oogonia.

Fig. 7. *L. bandoniensis*. Empty germinated chlamydospores, with their contained filaments and sporangia.

Bandon, Co. Cork.

A VISIT TO THE COPELANDS.

BY C. B. MOFFAT.

ON August 21st, Mr. R. M. Barrington and I visited the three islands off Donaghadee which compose the Copeland group, and are named respectively Copeland, Lighthouse Island,¹ and Mew Island. To explore Mew Island was our principal object. This, the outermost of the three, is a spot well known by name to readers of Thompson's "Natural History of Ireland." It was in Thompson's day remarkable as a great breeding-ground of Terns, chiefly Arctic, but intermixed to a considerable extent with two other species, the Common and Roseate Terns; the best clue to their respective proportions being given in the result of four expeditions made by Thompson to the islet between 1827 and 1849, during which he shot 35 Terns at random, and found that he had killed 21 Arctic, 6 Common, and 8 Roseate Terns, making the proportion of *Sterna macrura* 60, of *S. fluviatilis* 17, and of *S. Dougalli* 23 per cent. Though Mew Island still rears its annual multitude of "Mews" (the local name for Terns²), it is to be feared that such a census would now yield widely different results; still, in approaching so noted a former stronghold of the Roseate Tern, one could not but "hope against hope" for the chance of restoring this beautiful bird to our fauna. Any such hope was, however, quickly dashed to the ground, when on reaching the island we learned that the Mews had "yesterday" (as one of the residents put it), taken their departure.

A party of Turnstones at the water's edge presented the most interesting ornithological sight witnessed on Mew Island. But a list of all the birds observed by us on the three islands, and inclusive of a few seen from the boat when nearing them, will not greatly overcrowd the pages of the *Irish Naturalist*.

¹ The lighthouse at present in use stands however on Mew Island.

² Thompson (vol. iii, p. 271), questioned whether the name of Mew Island was derived "from these birds (Terns) or gulls having formerly frequented it." It therefore seems to me worth noting that at Donaghadee and on the islands we heard the Terns invariably spoken of as "Mews."

They number 20, and are as follows:—Wheatear, Robin, Meadow Pipit, Rock Pipit, Swallow, Corn Bunting, Starling, Rook, Sky-lark, Cormorant, Gannet, Heron, Ringed Plover, Turnstone, Oyster-catcher, Snipe, Redshank, Curlew, Herring Gull, and Razor-bill. The Bunting and Snipe were observed only on the largest and innermost island (Copeland proper), while to the best of my recollection the only Passerine birds seen on Mew Island were the Meadow Pipit, Starling, and Rook. On Mew Island were also seen a Tortoiseshell Butterfly (*Vanessa urticæ*), and a Wasp, whose species we did not ascertain.

On the larger island we were much struck with the profusion of now-withered stems of the Spring Squill (*Scilla verna*), already recorded for the group on Mr. S. A. Stewart's authority, in the *Cybele Hibernica* and *Flora of the North-East of Ireland*; and observed also *Cenanthe Lachenalii*, *Æ. crocata*, *Lamium intermedium*, *Polygonum Raii* and *Carex distans*. In the "Flora of the N.E. of Ireland" these are all named as occurring on the Down coast, and several of them in the immediate vicinity of Donaghadee, so that their presence on the adjacent islands is not surprising; still, I am not aware that they have been previously observed there. A large Burdock growing among ruins on the so-called Lighthouse Island, and probably the form that is recorded from Donaghadee as *Arctium nemorosum* by Stewart and Corry, is referred by Mr. A. Bennett to *A. intermedium*. In a pool on Mew Island Mr. Barrington discovered a remarkable *Callitriche* with very broad obovate leaves, which, while considering it probably referable to *C. stagnalis*, he thought best to forward to Mr. Bennett as well as to Mr. J. Groves. Both Mr. Bennett and Mr. Groves regard it as a very extreme form, and Mr. Barrington proposes to call it *C. lemnoides* as he "mistook it at first sight for a duckweed." A narrow-leaved plant (? *C. hamulata*) found in an adjoining pool, also appears to deserve attention, should any botanist contemplate a future descent on Mew Island.

I will add that on the day following our visit to the isles we had the pleasure of being conducted by Mr. S. A. Stewart through the Belfast Natural History Museum, and were shown many ornithological specimens of great interest. From the notes we had time to take, I see that at least five of the birds here exhibited possess the two-fold distinction of having been the

first of their species obtained in Ireland, and of claiming William Thompson as sponsor to their identifications. These are, the American Bittern shot at Armagh in November, 1845 (Thompson, vol. ii., pp. 168-9); Bonaparte's Sandpiper, *Tringa Schinzii*, Bonaparte, believed to have been shot in Belfast Bay in April, 1836 (Thomp., ii., p. 297); Broad-billed Sandpiper shot in Belfast Bay in October, 1844 (Thomp., ii., p. 282); Bonaparte's Gull shot on the Lagan in February, 1848 (Thomp., iii., pp. 317-20); and the Surf Scoter shot in Belfast Bay in September, 1846 (Thomp., iii., pp. 118-9). Of these five it is remarkable that all except the third are stragglers from America. Other noteworthy birds in this Museum are the female King Duck shot in Belfast Bay in March, 1850 (Thomp., iii., p. 116); the Snowy Owl shot on Scrabo mountain in December, 1837 (Thomp., i., p. 97); the second recorded Irish specimen of the Pomatorine Skua (Thomp., iii., p. 392); one of the two Buff-breasted Sandpipers shot in Belfast Bay in 1864 (*Zool.*, 1866, p. 389); the first authenticated Irish specimens of the Stock Dove (1875), Red-backed Shrike (1878), and Pink-footed Goose (1891); a Spotted Crake mentioned by Thompson (vol. ii., p. 319) as killed near Belfast in 1822; a Night Heron shot at Monaghan, January, 1855 (*Zoologist*, 1857, p. 5429), and several rarities scarcely less valuable. There is a fine collection of birds' skins from Rathlin Island, which we were shown, but time allowed of only a very hurried inspection of these; indeed, it may be well to say that few of the birds in the Museum were critically examined, except two "Carrion Crows," of which one proved to be *Corvus frugilegus*. Curiously, one of the first objects on which our eyes chanced to fall was a Roseate Tern, the locality on whose label was "Mew Island."

Ballyhyland, Co. Wexford.

EPILOBIUM ROSEUM IN IRELAND: IS IT NATIVE?

BY J. H. DAVIES.

SOME observations with which I have been favoured have led me to think that it might be desirable that I should briefly state the considerations which caused me to arrive at the conclusion that *Epilobium roseum* is indigenous in Ireland, as expressed in my former communication (*supra* p. 7).

Were it not for the doubt which some able botanists have entertained on the question, the possibility of the plant not being native in any of the several places in which I have seen it in the North, would never have entered my mind. It is not a cultivated plant, and thus escapes any suspicion of being a garden waif. The only way in which it could have been carried hither, it seems to me, would be with imported soil. This is also the opinion of my friend, Mr. J. G. Baker, of Kew. But the nature of the situations in which it occurs precludes the notion of any such importation.

Mr. Praeger informs me that he has met with it in a garden in Dublin, and that although he has found it in a different situation in Co. Louth, he does not think it can be claimed as native. But the circumstance of its occurrence in a garden is by no means singular. So far I have not seen it in gardens, but Templeton notes it as having occurred in his orchard; and that it very frequently does spring up in gardens there is ample testimony. The same holds good of some other Willow-herbs. *E. montanum*, *E. obscurum*, *E. parviflorum* and even *E. hirsutum* also occur in gardens; but as plants with wind-borne fruit, do they not come there spontaneously? It will not be supposed that any of them is directly introduced. On the other hand, in most instances, they would more likely be regarded as unwelcome intruders,

"Up there came a flower,
The people said a weed,"

and care would be taken to eradicate them.

Mr. Bagnall, in his "Flora of Warwickshire," (1891), ranking it as native, writes of *E. roseum* :—"An abundant weed in my own garden, Aston, year after year, not introduced."

Revs. Purchas and Ley, who, in the "Flora of Herefordshire" (1889), give some garden localities, have the following pertinent and interesting note :—" *E. roseum* shows a preference

for the neighbourhood of human habitations, and is much more ready to thrive in the outskirts of towns and villages than is *E. montanum*." Many noteworthy instances of its partiality for such localities are supplied in Trimen and Dyer's "Flora of Middlesex" (1869), two of which I may be excused for quoting:—"Marylebone Infirmary garden, 1830," and "under walls of Henry VII.'s Chapel, Poet's Corner, Westminster." It is needless to encumber these pages with citations of other examples of its occurrence in similar places, many of which I have before me as I write.

In some of its localities it is not constant. A most acute and exact observer, Mr. Foggitt, gives me information of one such by a stream-side, where he first noticed the plant in 1878, in great abundance, but year after year it continued to diminish in quantity until now it has entirely disappeared, not a solitary plant remaining. At the same time there is no uncommon plant in his district for which he has more numerous additional stations. In Yorkshire, he says, "it very often springs up in newly disturbed soil, particularly in town gardens," and he thinks it likely that the seeds must sometimes remain long dormant, in like manner as, for example, those of *Erysimum cheiranthoides* and *Hyoscyamus niger*.

The earliest mention of *E. roseum* as a British plant seems to be in Symon's "Synopsis" (1798) wherein it is stated that in England it was first recognised by Curtis in Surrey.¹

Templeton sets it down in his notes as having been detected by him in 1820, only twenty-two years later. His exact words are "*E. roseum* E. Bot. 693, found and determined by me in the orchard, Aug. 13, 1820."² That his plant was true *E. roseum* has been questioned, but though the most careful are liable to error, it is hard to believe that so accurate a botanist as Templeton could have been mistaken in regard to a plant having distinguishing specific characters so well marked as are those of this Willow-herb. That the species did exist near Belfast, so late as 1846, seems certain. Mr. Stewart and Mr. Corry, who in more recent years made painstaking search, failed to find it, and say "it must in this case be reduced to the rank of a casual only." Had they succeeded in their quest, might they not, in that case, have taken a different

¹ As cited in Clarke's *First Records of British Flowering Plants*.

² In MS. "Catalogue of the native plants of Ireland observed by John Templeton, A.L.S.," now in Belfast Museum.

view? When it is considered that this *Epilobe* is uncertain in its appearance, and without permanence in some of its localities, it will not appear so surprising that it could not be refound in places where it may have been known to occur half a century ago. That John Templeton found the plant in his orchard, and Dr. Robert Templeton by the Lagan canal, now seems to be not so unlikely as was previously supposed. So late as last November, I found some examples on a sheltered wall at Ballydrain, which is still nearer Cranmore than are the localities that were before mentioned: Ballydrain is indeed scarcely more than a mile from Cranmore.

Moore and More, in "*Cybele Hibernica*," in desiring verification of "*Banks of Lagan, near Cranmore*" and "*Glen in Hollywood Hills*," thought that "at present the kind of station seems rather suspicious." But why should the kind of station excite suspicion? Reference to some of the English county Floras will show that "*Banks of streams in sandy or peaty ground*," "*Damp places*," "*Copses and moist places*" are given as some of its known habitats.

Following some conversation with Mr. Stewart, to whom I described the characters of the situations in which our *Epilobium* occurs here, he writes:—"I do not say that I don't now accept *E. roscum* as a native, on the contrary, the evidence is strongly in its favour, but in the case of a plant to which others have attached so much suspicion I do not like to commit myself positively without more prolonged investigation," which is in accordance with his usual commendable caution. Judging from what I have already seen of the plant, my own opinion is that it has most probably been overlooked, and that the main result of extended investigation will be to show that it is more widely distributed than has hitherto been believed.

It may be said that such fragmentary evidence as I have ventured to produce is not of a positive character. That may be so. The question that has been raised is one in which it is scarcely possible to arrive at absolute certainty. It must remain a matter of opinion; and considerations in support of either view which may satisfy one, may be deemed insufficient by another. For my own part I can discover nothing whatever to disturb my conviction that *Epilobium roscum* is native in Ireland; and in expressing this as my belief, I hope I have avoided doing so in any spirit of dogmatism.

RECENT GEOLOGICAL WORK IN THE COUNTY OF WATERFORD.

A Popular Sketch of the Geology of County Waterford. By F. R. COWPER REED, M.A., F.G.S. Fabb and Tyler, Cambridge, 1897.

The Red Rocks near Bunmahon on the coast of County Waterford. By F. R. COWPER REED, M.A., F.G.S. *Quart. Journal Geol. Soc. London*, May, 1897.

The Fauna of the Ordovician Beds near Tramore. By F. R. COWPER REED, M.A., F.G.S. *Geol. Mag.*, November, 1897.

Of the first of these papers the Author tells us in his preface, that it "was not written in the first instance for publication, but is now printed by request," and "that his aim has been to present a concise and popular account of the geology of the district with a view of stimulating local interest in the science." On reading the paper one feels bound to say that Mr. Reed has succeeded in the first part of his object, and, that it is only necessary to bring it under the notice of students of geology in the district, to make the second portion an accomplished fact. Technical terms are avoided as far as possible, and those who wish to go deeper into the subject are referred to standard works, dealing in detail with special points only touched on in this paper. In the introduction the most prominent physical features of the county are sketched out. The western portion is mountainous, as compared with the eastern, which forms a comparatively slightly elevated plain; and Carboniferous and Old Red Sandstone rocks form the valleys and hills respectively, while in the eastern portion Ordovician rocks are principally developed. Attention is drawn to the gaps in the regular succession of the geological formations of the county. The Silurian period is not represented, and all the formations between the Carboniferous and Glacial periods are missing in this district. A detailed account is next given of the Ordovician rocks of this area, and the conditions prevailing at the time of their deposition. The oldest rocks of this series belong to the Llandeilo epoch, when great volcanic activity prevailed, resulting in the formation of a chain of islands running in a line north-east and south-west. From vents in these islands lava and ashes were deposited in the neighbouring sea, and during quiet intervals, mud brought down from the land buried the invertebrate organisms which then existed, and whose remains we now extract from the rocks as fossils. At the close of this period the land was again uplifted by the earth-movements which produced the "Caledonian" system of folds, and a large island was formed, which remained above the sea till upper Old Red Sandstone times. The depression which followed resulted in the formation of a huge brackish-water lake, the actual shore-line of which may still be traced at

Goresbridge, Co. Kilkenny. Its beaches are now the conglomerates, and the finer material deposited in the lake form the sandstones which are a familiar feature in this county. The floor of the lake continued to sink, and the deposited material had attained to a thickness of over 3,000 feet, when the sea gained admission, and the Carboniferous era was inaugurated. At first the deposits were terrigenous, but the sea becoming more open, pure limestone began to be formed; this state of affairs continued for a considerable time till an extensive area was covered with this formation, which reached a thickness here of probably 1,800 feet. Of organisms which contributed to the making of this limestone the most abundant were crinoids or sea-lilies; and recent research has proved the presence of siliceous sponge-spicules and Radiolaria. Subsequently a shallowing of the waters took place, sandy and pebbly deposits therein formed the Millstone Grit, and the encroachment of the land on the sea formed lagoons. Around these, dense jungles and forests arose, and all the conditions essential for the production of coal-beds, which at this period were formed on a large scale. None are now found on this district, having been denuded off during the long interval between the Carboniferous and the Glacial periods. A picturesque description of animal and vegetable life at this time follows, and a comparison is instituted between the state of affairs then, and the actual condition of the mangrove swamps of tropical countries. The Post-Carboniferous history of Co. Waterford is next dealt with. Earth-movements which took place at the end of the Carboniferous period, bent the strata in this district into a series of folds whose axes run east and west, depressed them below the sea, and when subsequent upheaval brought these folds under the action of the waves, a "plain of marine denudation" resulted. Continued upheaval elevated this plain above sea-level, where it remained during untold ages exposed to aerial denudation, which removed some 5,000 feet of strata. The main physical features of the county as we find them at present were produced in this interval; though probably, prior to the Glacial epoch the land stood some hundreds of feet higher than it does now. An interesting account follows dealing with the origin of the surface features of the district. The history of the various rivers is traced from their very beginning, when as "consequent" streams they flowed southwards down the plain of marine denudation across the strike of the Carboniferous and Old Red Sandstone beds. Later on "subsequent" streams arose along the strike of these same beds, and in some cases developed so rapidly as to become the main drainage system of the district, cutting off earlier-formed "consequent" streams and converting them into mere tributaries. The erosion by these streams, and the changes in their courses at various intervals, due to the rapid wearing away of the softer strata, resulted in time in the formation of the mountain-ranges as we now find them, the direction of the ranges being determined by the east and west anticlinals produced about Permian times. The last few pages of Mr. Reed's paper are devoted to an account of the Glacial epoch; and the evidence, which is abundant in this area, and on which geologists rely to prove that submergence and upheaval of the land took

place frequently during this time, is clearly expressed. The paper will be read with interest not only by the student of geology, but also by the general reader who would know and understand the "record of the rocks" in Co. Waterford.

In the next paper, read before the Geological Society, the author discusses the question as to the age of certain red sandstones, shales, and conglomerates which occur on the coast of Co. Waterford near Bunmahon. From 1833 these rocks have been the subject of much discussion, for while some believed them to belong to the Old Red Sandstone period, others considered them to be Ordovician, while later observers have suggested that they may be Silurian. Our author has endeavoured to decide the question, and has thoroughly examined the rocks, and also the structure of the surrounding area.

The result of his investigations he gives in this paper, in which are detailed the observations he has made, and the deductions he draws therefrom. As a preliminary observation he points out that the Old Red Sandstone forms here a kind of elliptical ring round the Ordovician, being evidently the remains of an elongated dome now denuded away. Mr. Reed states that the southern portion of this ring is beneath the present sea-level, and he believes that the red beds at Bunmahon are fragments of it.

It is noted that the rocks in question have not shared in the general crushing and faulting of the Ordovicians, being comparatively undisturbed, and in some cases, that the basal layer of these rocks is frequently a breccia of fragments of the underlying rocks. A suggestion is put forward which might explain the present position of the rocks under consideration, and it is shown how an examination of the Bunmahon mass proves it to be bounded on each side by faults, which may be distinctly traced in the field. Mr. Reed considers that all the evidence goes to indicate that the red rocks in this locality are inliers of the Old Red Sandstone formation, which is extensively developed in other parts of the county, and that they have been brought down by cross-faulting into their present position amongst the Ordovician rocks.

The final paper is the first of a series which its author intends to prepare on the "Fauna of the Ordovician beds of County Waterford." In this paper the fossiliferous rocks which are exposed near Castletown, at Quilla, and Pickardstown, and at Newtown Cave are singled out for description. "They have been examined with a view to establish a definite base-line which has previously been wanting in descriptions of these rocks." In the beginning of the paper the author gives four reasons for dissenting from what he calls the confusing statement made by practically all previous observers, viz., that a mixture of Llandeilo and Bala fossils is found in these beds and elsewhere in Ireland, and that the principles of classification followed in Great Britain are not applicable. He feels convinced that one reason amongst others for this statement is the erroneous identification of the fossils, and states that one fossil from Quilla and Pickardstown was wrongly identified as *Phacops Brongniarti*, being really *Phacops Jamesi*. It also appears that the list of graptolites compiled for the Survey Memoir as collected from locality 21 is mis-

leading owing to the incorrect determination of the species. Perhaps it would be better to have said that the list published in 1865, when very little about graptolite species was known as compared with our present-day knowledge, is now found to be misleading in the light of more recent discoveries. Some specimens have been determined by Miss G. Elles of Newnham College.

From a comparison of the fauna collected in the localities above mentioned, with that obtained at definite and well-known horizons in the sister isle, Mr. Reed has come to the conclusion that four distinct horizons may be traced. The succession of the fossil beds near Tramore is stated to be as follows:—

- (4.) Shales, mudstones, and impure limestone of Newtown Cave (=greater portion of the Balcletchie Beds).
- (3.) Impure sandy limestone of Tramore bay cliffs, including towards the base the Quilla and Pickardstown beds (=lower portion of the Balcletchie Beds and portion of the Benan Conglomerate).
- (2.) Black slates of Carrigahalia (= Glenkiln shales).
- (1.) Unfossiliferous dark slates.

The paper is illustrated by numerous sections from the locality under examination.

HENRY J. SEYMOUR.

Dublin.

NOTES.

BOTANY.

PHANEROGAMS.

The New *Cybele Hibernica*.

We learn that the new edition of *Cybele Hibernica*, the preparation of which has engaged the editors for upwards of two years, is now in the press and will be published in a few months. This much enlarged second edition, which is founded on the papers of the late Alexander Goodman More, will present many new features, and embody the latest results of botanical exploration in Ireland. The editors are Nathaniel Colgan, M.R.I.A., and Reginald Scally, F.L.S., friends of the late A. G. More, and occasional contributors to this Journal. A full prospectus is to appear shortly.

Early Flowers.

I observed Sweet-scented Butter-bur (*Petasites fragrans*) in flower at Windgates, Co. Wicklow, on November 27th, and Lesser Celandine (*Ranunculus Ficaria*), near Milltown, Co. Dublin, on December 1st.

Dublin.

R. LLOYD PRAEGER.

ZOOLOGY.

INSECTS.

The Male of *Vespa austriaca*.

I very much regret that Rev. O. P. Cambridge's record of the capture of the male of *Vespa austriaca* in Dorsetshire escaped my notice before my communication on that species was printed. My paper was originally written at the end of the summer of 1896, before the discovery recorded in the *Ent. Monthly Mag.*, and my attention was not called to this until too late for the correction.

I may remark, however, that it must be admitted that there is a strong contrast between the chance capture of a single male and the occurrence of scores, if not hundreds, of females.

In a recent letter Mr. Saunders points out that the principal difference between the male of this species and of *V. rufa* is in the pubescence of the tibia or shank. "The tibiæ are haired much as in *V. sylvestris*, otherwise it resembles *rufa* without the red or brown marks—both sexes seem to be very rare in England."

H. G. CUTHBERT.

Blackrock, Co. Dublin.

Coleoptera of Upper Lough Erne, Co. Fermanagh.

The following is a list of the less common beetles, selected from over 300 species, captured by me during part of the summer, autumn, and winter of 1896, and the first three months of 1897. Many are decidedly rare or local in their occurrence in Ireland, as *Blethisa multipunctata*, *Megacronus cingulatus*, *Philonthus lucens* and *Erirrhinus æthiops*, while *Cercyon nigriceps* var. *centrimaculatus* is here recorded as an Irish species for the first time. I am indebted to the Rev. W. F. Johnson and Mr. J. N. Halbert for the naming or verification of all my captures:—

CARABIDÆ.—*Carabus clathratus* (probably common, as though I captured few living specimens, its remains were abundant); *Blethisa multipunctata* (common on the lake shore); *Chlenius nigricornis*; *Stomis puniceus*; *Amara lunicollis*; *A. spinipes*; *Calathus piceus*; *Anchomenus oblongus*; *A. viduus* (and var. *mæstus*); *Bembidium æneum*; *B. v.-striatum*; *B. bruxellense*; *B. rufescens*.

DYTISCIDÆ.—*Calambus v.-lineatus*; *Deronectes depressus*; *Hydroporus lineatus*, *Ilybius ater*; *I. obscurus*, Marsh (one example, a rare species); *Rhantus exoletus*; *Acilius sulcatus* and *Gyrinus minutus* (both of these were taken on bog land); *Orectochilus villosus* (lake shores under stones).

HYDROPHYLIDÆ.—*Cercyon nigriceps* var. *centrimaculatus*, Sturm. (not previously recorded as an Irish species); *C. quisquilius*.

STAPHYLINIDÆ.—*Aleochara brevipennis* (rare); *Myrmedonia collaris*, *Tachyusa atra*; *Autalia impressa*; *Gyrophæna levipennis*; *Bolitochara obliqua*; *Cilex silphoides*; *Tachinus subterraneus*; *Megacronus analis*; *M. cingulatus* (commoner than the preceding in this district); *Quedius mesomelinus* (and a variety doubtfully referred to var. *fageti*, Thoms. by Dr. Sharp);

Creophilus ciliaris, Steph. (first record from a midland county); *Leiss totrophus nebulosus* (one specimen); *Philonthus splendens*; *P. intermedius*; *P. addendus*; *P. carbonarius*; *P. lucens* (only found in one locality; rare in Ireland); *P. umbratilis*; *P. albipes*; *P. cephalotes*; *P. longicornis* common; *P. debilis*; *P. ventralis*; *P. fumarius* (common in one locality); *P. puella*; *Leptacinus linearis*; *Baptolinus alternans*; *Lathrobium quadratum*; *L. filiforme*; *L. longulum*; *Cryptobium fracticorne*; *Lithocaris ochracea* (in hot-beds); *Stenossium*; *S. flavipes*; *S. paganus*; *Haploderus cœlatus*; *Olophrum piceum*.

SILPHIDÆ.—*Agathidium rotundatum*; *Necrodes littoralis*; *Choleva agilis*; *Silpha attata*, var. *subrotundata* (the variety only occurs).

HISTERIDÆ.—*Hister neglectus*.

COCCINELLIDÆ.—*Adalia oblitterata*; *Coccinella hieroglyphica*; *Halysia, xvi.-guttata*.

SCARABÆIDÆ.—*Aphodius depressus*; *A. rufescens*; *Melolontha vulgaris*.

ELATERIDÆ.—*Cryptohypnus dermestoides*; *C. iv.-guttatus*; *Corymbites testelatus*.

CHRYSOMELIDÆ.—*Donacia impressa*; *Chrysomela hyperici*; *C. polita*; *Adimonia tanacetii* (common under stones); *Psylliodes picina*.

CURCULIONIDÆ.—*Otiorrhynchus rugifrons*; *Barynotus Schonherri*; *Alophus triguttatus*; *Sitones puncticollis*; *Hylobius abietis*; *Erirrhinus æthiops* (very common at roots of grass above flood-mark); *E. scirpi* (in some locality as preceding, but apparently rarer); *Dorytomus maculatus*; *Gymnetron labilis*; *G. beccabunge*.

ENDYMION PORTER.

Belleisle, Co Fermanagh.

MOLLUSCS.

The Mollusca of the Great Skellig.

I much regret having omitted from my list of the Skelligs mollusca in last month's *Irish Naturalist* (pp. 9-11) all mention of *Clausilia bidentata*. Mr. Welch was good enough to forward me a specimen collected on the rock by the Rev. Mr. Lett. He also sent me at the same time *Cochlicopa lubrica* from the same locality.

R. S. SCHARFF,

Science and Art Museum, Dublin.

An abnormal *Solen siliqua*, L.

Mr. R. Welch, of Belfast, has submitted to me a remarkably shaped shell of this species, found at Ballyholme, Co. Down, by Mr. W. Swanston, in 1896. The peculiarity of the specimen lies in its being strongly curved *laterally*, that is, in a plane at right angles to the direction of curvature in the var. *arcuata*, Jeff. When the shell is viewed from above the curve is seen to form the arc of a circle approximately 43 cm. (17 inches) in diameter. The convex right valve measures 19 cm. in length. Now, although I have before seen specimens of *Solen* and *Ceratisolen* more or less laterally bent, such examples were always found, on close scru-

tiny, to owe their abnormal form to an injury to the shell or some other external cause. The specimen under consideration affords no such evidence. The curvature and the lines of growth are quite regular, and everything seems to indicate that the shell is an example of a group of departures from the normal form which are perhaps best called individual abnormalities as I have elsewhere previously suggested. Varieties, rightly so called, they are not: monstrosity is a term correctly applicable only to such abnormalities as originate during embryonic life. True, the term monstrosity is used in a deplorably loose way by conchologists, who apply it not only to true teratological specimens, but to abnormalities resulting from disease and injury as well as to such individual peculiarities as we are considering. These "sports," as a gardener might call them, are always interesting and worthy of record, inasmuch as they may sometimes throw a side light upon important biological problems. The occasional transmission and perpetuation of such sport-characters would seem a strong argument against the germ theory of Weissmann.

GEO. W. CHASTER.

Southport.

BIRDS.

Montagu's Harrier breeding in Ireland—Correction.

I am sorry to have to correct the statement I made in the *Irish Naturalist* for October last. The specimen of the supposed *Circus cineraceus* shot in Co. Kerry has again been examined by Dr. Sharpe; and he and Mr. Howard Saunders, who has also kindly inspected the skin, have after all pronounced it to be only a young cock Hen Harrier.

JOHN H. TEESDALE.

St. Margaret's, W. Dulwich, London, S.E.

Black Redstart in King's County.

As the Black Redstart (*Ruticilla kitys*) is not a very frequent visitor to Ireland, it may be of interest to report that I obtained a specimen (a female) on November 6th, 1897, at Leap Castle, Roscrea, King's County. The bird flew into the house, and was captured by Mr. J. C. Darby, with whom I was staying.

Heathfield, Blackheath, London, S.E.

HARRY F. WITHERBY.

Mealy Redpoll off Coast of Kerry,

In the *Zoologist* for November, Mr. R. M. Barrington, writes:—Between 1889 and 1893, I received seven specimens of the Mealy Redpoll from the Tearaght Rock, a small but precipitous rock out in the Atlantic, nine miles west of Kerry. These Redpolls are very large, and I have always regarded them as Greenland Redpolls, *Linota Hornemanni*, Holb. In this I hope to be confirmed by Mr. Howard Saunders, to whom two stuffed specimens have just been forwarded. Five were obtained in September, one in October, and one in November.

Hawfinch in Co. Antrim.

When passing a beech-wood in the townland of Knockboy, near Broughshane to-day, I saw one of these birds (female). I was unable to see any others, nor have I heard of a specimen being seen in Co. Antrim before.

Antrim.

H. D. M. BARTON.

Supposed Great Spotted Cuckoo in Ireland.

Mr. R. M. Barrington writes to the *Zoologist* for December, quoting the description of a bird supposed to be a Great Spotted Cuckoo, seen by the light-keeper of the Great Skellig off the Kerry coast, on April 30th of last year.

Crane in Co. Tipperary.

It will doubtless be of interest to place on record that a very fine specimen of the Crane (*Grus communis*) was shot at Seskin, about three miles from this town, by a farmer named J. Delahunt, in September, 1896, and presented to Mr. Carrigan, solicitor, Thurles, who had it mounted by Messrs. Williams and Son of Dublin. These birds are, I understand, rare visitors to Ireland.

W. JOHNSTON.

Thurles.

Bittern in Co. Galway.

A very fine specimen of the Common Bittern (*Botaurus stellaris*), was shot here in the last week in November. The place where it was found is an ideal habitat for this bird, and I should not be surprised if it breeds there. If so, it is to be hoped that such a rare and interesting bird will not be further molested, and that its "boom" or love-song may again be heard in the land. This specimen is now in my possession.

R. M. GILMORE.

Galway.

Little Bittern in Co. Cork.

Mr. M. Sweetman, Lemcon House, Schull, sent me on November 9th, a Little Bittern (*Ardeetta minuta*) which he had shot the previous day. It seems strange that such a rare visitor from warmer climes should appear when our regular winter migrants are arriving. Its comparatively short legs and very long toes seem to me better adapted for running on the surface of the mosses and other water-plants than wading through them, the strong legs and laterally compressed body, as in the Water Rail also I think imply a much more active life than that of the Heron. Its colour is well suited for concealment among reeds.

Skibbereen, Co. Cork.

JOHN J. WOLFE.

GEOLOGY.

Irish Caves.

Mr. E. A. Martel, of Paris, contributes to the *Geographical Journal* for November last, an article entitled "British Caves and Speleology," in which he gives an account of his explorations of English and Irish caverns, and urges the importance of instituting further explorations.

FIELD CLUB NEWS.

The Limerick Club held its Annual Meeting on January 11th, and it was of an interesting and highly successful nature. The growing up of a scientific society of 240 members in one of our western towns is an important feature in the past year's work, and we congratulate Limerick heartily. Let us hope that the work turned out by the Club will be proportionate to its membership—the Society has a splendid field for its operations.

We understand that the Belfast Field Club are undertaking the working up of the less known groups of animals, plants, and rocks of their district, with a view to placing themselves in a position to issue a new and improved edition of their "Guide to Antrim and Down." This work was produced on the occasion of the visit of the British Association in 1875, and is now out of print.

Attention is called to the resolution passed at the Annual Meeting of the Dublin Field Club, held on January 11th, anent the teaching of natural science in Irish schools. The resolution was supported by a number of members whose opinion on this subject carry considerable weight. A similar resolution, it will be remembered, was unanimously adopted at the Field Club Union Conference held at Galway in 1895.

A grant from the Royal Bounty has been received by Mr. Joseph Wright, F.G.S., of the B.N.F.C., as a recognition from Government on account of his services to science by his researches on fossil and recent foraminifera, &c. Some of his work has been published in the *Appendices* of the Belfast Naturalists' Field Club. Mr. Wright's friends in the Belfast Club presented an address of congratulation to him on the 14th December, 1897. A copy of the Address and Mr. Wright's reply appears on another page.

The Winter Meetings of the Sections of the B.N.F.C. are well begun. These meetings are open to all members of the Club desirous of doing work in any of the Branches. It is a pity that more general interest is not shown by increased numbers joining these Sections, as much good work might be done by a little more co-operation and intercommunication among the members in this way.

PROCEEDINGS OF IRISH SOCIETIES.

ROYAL ZOOLOGICAL SOCIETY.

Recent gifts include a Peregrine Falcon from Mrs. Crabbe, and five Lizards from Mr. A. Hillas. A pair of Bactrian Camels have been imported from the Kirghis steppes. A litter of Cape Hunting puppies have been born in the Gardens, but unhappily did not long survive.

2,839 persons visited the Gardens in December.

DUBLIN MICROSCOPICAL CLUB.

DECEMBER 16.—The Club met at the house of Dr. M'WEENEY, who showed slides and cultures from a case of septicæmia in calves. The micro-organism belongs to the group of hæmorrhagic septicæmia, and appears to be new.

PROF. GRENVILLE COLE showed calcite-granite from Lime Hill north of, Pomeroy, Co. Tyrone. This remarkable rock, described by Mr. Jos. Nolan in the Memoir of the Geological Survey, seems to be one of the ordinary granites of the district which has become locally charged with abundant calcite. This carbonate has replaced much of the felspar, and now appears in masses interlocking with the quartz. The rock has even been burnt as a local source of lime.

MR. GREENWOOD PIM showed *Hydnum oetraceum*, Pers., collected last year at Cappagh, Co. Waterford, by Prof. Johnson. It is one of the resupinate forms, forming a golden skin on dead sticks. The spores are so minute that it might be readily taken for some species of *Corticium*, but a hand lens at once shows the spring hymenium characteristic of the genus *Hydnum*.

PROF. T. JOHNSON showed a preparation of *Tuber dryophilum*, Tul., of which two species had been received from Mr. Biggs, of Borrisokane, Co. Tipperary. This truffle, apparently not before recorded for Ireland, was found growing with *Tuber æstivum* under beech trees. The exhibitor thought the fungus might be an *Elaphomyces*, but it had been identified at Kew as *T. dryophilum*.

MR. MCARDLE exhibited both male and female specimens of a pretty olive-coloured *Radula* which he collected last September at Torc Waterfall, Killarney. Its nearest congener is *R. voluta*, from which it is abundantly distinct, in cell structure, branching, and above all in the lobule which is nearly half the breadth of the superior lobe on which it lies flat, and forms a sharp angle; also in the long amentæ which occur both terminal and lateral. Further investigations are necessary, and it is essential that it should be carefully compared with specimens of *R. Lindbergii*, Gott, and *R. Carringtonii*, Jack., before naming it.

Mr. G. H. CARPENTER showed *Isotoma litoralis*, Schött, a collembolan which had been collected by Mr. Halbert for the R.I.A. Flora and Fauna Committee on the shore at Leenane, Co. Galway, in April, 1897. This springtail, an addition to the fauna of the British Islands, is easily recognised by the short and blunt mucrones of the spring, and the general resemblance of the insect to an *Achorutes*. The species is figured and described by Schött (*K. Svensk. Vet. Akad. Handl.* Bd. xxv., 1892, No. 11, pp. 75-6, pl. vi., ff. 46, 47, pl. vii., f. 1). It is recorded only from Spitzbergen, Sweden, and Finland, so the presence of such a characteristically northern animal on the western coast of Ireland is of great interest.

Mr. A. VAUGHAN JENNINGS showed a specimen of *Hematococcus nivalis*, the organism which forms the "Red Snow," collected in June last, near the summit of the Fluela Pass in the Eastern Alps. The plant is one of the unicellular algæ in which the chlorophyll is hidden by a red colouring matter. Though usually associated with the Arctic regions, in parts of which it occurs in great abundance, it was described from the Savoy Alps by de Saussure in 1760. It has since been found in other parts of Switzerland, the Pyrenees, Urals, Siberia, and California.

For comparison, the exhibitor also showed a preparation of the same organism made many years ago by the late Dr. W. B. Carpenter, from material brought home by Sir Leopold McClintock after the Franklin Search Expedition of the "Fox." It was collected near Cape York, at a place which had been named by Ross in 1818, "the crimson cliffs," on account of the striking effect produced by the wide extent of its growth.

Mr. HENRY J. SEYMOUR showed a thin section of eurite from Kingstown Pier. The eurite vein was originally *in situ* probably on Dalkey Hill. The rock is fine-grained and contains numerous very small crystals of black tourmaline or schorl. A section of one of these perpendicular to the principal axis, showed the central portion of the crystal to be composed of indigolite, the blue tourmaline; the outer portion being schorl. This structure is fairly common in large semi-transparent tourmalines, where the central portion is very often rubellite, the red variety of tourmaline.

Mr. ALLAN SWAN sent micrographs of two species of *Leptolegnia*—a genus of the Saprolegniaceæ—found by him near Bandon, Co. Cork, and hitherto only known by a single species, which was obtained by De Bary in 1888 from German mountain lakes. This species, *L. caudata*, De Bary, was shown photographed in several stages of maturity, while numerous other photographs illustrated the new species, which—at the suggestion of Prof. Hartog—has been called *Leptolegnia bandoniensis*. This new species—a full description of which with figures appears in the present number (pp. 29-37) differs from *L. caudata* mainly in its sexual fruit, which is produced in a large globular oogonium, which may contain from seven to about twenty oospores.

BELFAST NATURALISTS' FIELD CLUB.

DECEMBER 14.—An informal meeting was held in the Museum for the purpose of presenting to Mr. Joseph Wright, F.G.S., an address of congratulation on the occasion of the recognition of his valuable services to science by Her Majesty's Government. Mr. Swanston was called on to preside. A number of letters of apology and regret for non-attendance were received. William Gray was called on to read the address, which was as follows:—

“To JOSEPH WRIGHT, Esq., F.G.S.

“Dear Sir,—We, your fellow-members of the Belfast Naturalists' Field Club, sincerely and earnestly desire to congratulate you upon the distinguished honour conferred on you by Her Majesty's Government, in awarding you a grant of £150 from Her Majesty's Royal Bounty, in recognition of the very valuable services you have rendered to science by your laborious and long continued original researches into the palæontology of the Carboniferous, Liassic, Cretaceous, and Tertiary rocks of Ireland; more especially your investigation into the microzoa of the Secondary, Tertiary, and Recent deposits.

“This distinction is of the greatest satisfaction to your numerous scientific and private friends; and it emphasizes the honour done you a short time ago by the Geological Society of London. This, the parent and still the most distinguished geological society in the world, selected you as a distinguished Irish geologist to receive one of the highest recognitions of unaided service it is in the power of that Society to bestow—namely, a grant from ‘The Barlow-Jamison Fund,’ which was established for the advancement of geological science. After a prolonged and very cordial companionship, in some cases extending for a period of over thirty years, we have had ample opportunities of observing your earnestness, perseverance, and zeal in the prosecution of your favourite scientific studies, and the readiness with which you have placed the results at the disposal of others.

“We have profited by your teaching in the lecture room and in the field, and we have always found you a careful and efficient guide, a ready helper in our difficulties, and a most generous, courteous, and amiable companion. We therefore rejoice to learn of the distinguished position you have attained among the geologists of our time, and we earnestly hope you may be spared in health and vigour to continue your studies for many years to come, and still further benefit the world of science by the results of your systematic researches.”

The Address bears the signatures of the officers for the year, as well as the names of many of the members who were associated with Mr. Wright's work in the past. The Address was spoken to by Wm. Gray, M.R.I.A.; A. Speers, B.Sc.; and F. W. Lockwood, and J. Vinycomb, M.R.I.A.; and was then presented to Mr. Wright by the President. Mr. Wright, in reply, said:—

“I feel it quite impossible to convey in words my feelings on the pre-

sent occasion. Your most kind reception, as also your address expressive of your pleasure at the Treasury grant recently awarded to me for scientific research, is indeed most gratifying. I feel deeply indebted to Prof. A. C. Haddon, F.Z.S., who, I understand, took a most prominent and active part in the movement, as also to the many other kind friends who signed the memorial in my favour, and to whose influence was due my obtaining the grant. I also feel that many of the investigations I have been engaged at would not have been nearly so satisfactory or complete had it not been for the kind assistance of my fellow-members in supplying me with materials for examination, as also for their cordial co-operation in other matters connected with my work.

“To be recognised as having in the slightest degree advanced our knowledge of Irish natural history gives me the greatest pleasure, and that pleasure is enhanced by the fact that the President and so many of my fellow-members and co-workers in the Club are joined in this recognition.”

Afterwards the members proceeded to the large room of the Museum, when S. K. Kirker gave an illustrated lecture on “A Cruise round the West and South of Ireland, on the occasion of an Excursion of the Royal Society of Antiquaries in June, 1897.” The following, among other places, were described—Arran Islands in Galway Bay, Scattery Island, The Skelligs—Islands and Monastery, The Dingle Peninsula, Co. Kerry, Waterford and Lismore, &c., &c. The lecture was fully illustrated by limelight views from original photographs.

GEOLOGICAL SECTION. DECEMBER 30.—A paper was read by Jas. St. J. Phillips on “Potential Crystals,” dealing with the habits and growth of crystals as they occur in rocks. The effects of environment, pressure, and the chemical composition of the magma on the growth of crystals were dealt with. A specimen of granite from the Diamond Rocks, Mourne Mountains, served to illustrate some of the points, whilst others were shown by many microscopic slides and hand-specimens selected as far as possible from local rocks.

BOTANICAL SECTION. DECEMBER 18.—The orders forming the first portion of the division Gamopetalæ were discussed, and reference was made to Mr. Christy’s interesting paper on the Oxlip in the *Journ. Linn. Soc.* It was remarked as a strange fact that the Cowslip is not found in north-eastern Ireland.

LIMERICK FIELD CLUB.

ANNUAL MEETING.

JANUARY 11.—The fifth annual general meeting and conversazione of this Club was held in the Savings Bank, Glentworth-street. The large and representative attendance was a proof of the interest taken in this Club, whose operations extend over a wide area of country full of interest to the antiquarian and the student of nature. A striking feature of the proceedings was the number of photographic views of temples, castles, and cromlechs, and numerous views of scenery in Clare, Limerick, Galway, and other parts of Ireland, taken by members of the Club. Outside these there was a considerable variety of general exhibits which may be divided thus:—Botanical—Specimens of Dried Plants, including several additions to those previously recorded from this district; also lantern transparencies, kindly lent by Mr. R. Welch, Lonsdale Street, Belfast. Entomological—A Long-horned Beetle (*Rhagium bifasciatum*), and fir-tree stem attacked by its larvæ—Cratloe Wood. Examples of Cuckoo-Bees (*Apathus rupestris*) parasitic in nests of Humble Bee (*Bombus lapidarius*)—Cratloe Wood. Geological—Examples of rocks from the district, including porphyritic basalt from Caherconlish; volcanic scoriæ, &c., from Ballinagarde; sandstone, with embedded metallic crystals, from Cratloe; local limestones, fossils, &c. Photographic—Prints, lantern transparencies, new and improved photographic apparatus, including Professor Ives' kromskop, for producing pictures in natural colours. Archæological—Examples of stone and bronze implements, celts, ornaments, weapons, &c. Also a collection of small objects in silver. A series of lantern transparencies kindly lent by Professor A. C. Haddon, D.Sc., F.Z.S., illustrating "Adze-making in the Andaman Islands." There were on view specimens of corals, sponges, amber, ancient Egyptian instruments, Japanese bronzes and lacquered work, carvings, wooden pictures, &c. The Rev. W. E. Bentley, Mr. R. D. O'Brien, and Dr. George Fogarty had an extensive collection of rare plants tastefully placed on white cardboard, which were hung round the room.

The President (Dr. W. A. Fogarty) briefly opened the proceedings, and welcomed those present, and then asked the Secretary (Mr. F. Neale) to read the annual report, of which the following is an abstract:—

"The Committee are pleased to say that the working of the Club during the past year has been gratifying, the impetus given to it in public notice and favour by the successful annual meeting in January last having been maintained since. In January, 1896, there were 50 members; in January, 1897, 110; and now your Committee are able to report a membership of 214 on a list made up to the 30th of September last, the total number to the present date being 240, of whom there are but two whose subscriptions for the past year have not been paid. In arranging the programme for the current Winter Session, your Committee were easily able to arrange for the holding of fourteen evening meetings, the majority of which are filled by members of our own Club. The

significance of this is apparent, when it is remembered that in previous years not more than six meetings have been held, and that two of these were, as in the current session, allotted by invitation to visitors from sister societies, with which the Club is affiliated in Dublin, Belfast, or Cork.

"It is with pleasure that your Committee report the formation by some half dozen members of a Club harbarium during the past year, and that it has attained to 500 or more sheets up to the present, these containing all, or nearly all, the flowering plants of the neighbourhood, including more than twenty not hitherto recorded from this division of the country. The continuation of this work is desirable, and should be supported by the Club and its members in every possible way.

"The capture of a fine specimen of the Royal Sturgeon (*Acipenser Sturio*) was made on the 8th of July last by fishermen, near the mouth of the Mague river, its length being about 10 feet, and its estimated weight between four and five cwt.

"The chief item of entomological interest during the year has been the occurrence of the Brimstone Butterfly (*Gonepteryx rhamni*) at Broadford, Co. Clare, where a specimen was observed on May 29th. It is also reported as occurring regularly every spring-time at Wood Park, near Scariff. The sole food-plant of its larvæ, the Common Buckthorn (*Rhamnus catharticus*) has not yet been found in this district, except on Holy Island, in Lough Derg.

"It is also worth recording that on June 23rd, an Orthopteron (*Tettix subulatus*), an insect of the grasshopper family, was taken at Mountshannon, swimming freely in water, this being the second occasion upon which one of these creatures has been so captured by one of our members. The fact of any individual of the group entering water and seeming to be at home in it, not having been noticed elsewhere, or if noticed not recorded, is deserving of mention and of fuller investigation.

"Much good work has been done by the Photographic Section of the Club, as is shown this evening, its requirements being catered for this session at four educational meetings, for the lectures and illustrations at which the Club is under deep obligation to *The Amateur Photographer* and its proprietors.

"The opening of an Archæological Section last year has added greatly to the general interest taken in the Club, and its studies have been a decidedly attractive element in connection with several of last season's excursions. Archæology occupies three evenings in the current session, and has during the year had the first number of the Club Journal devoted to its interests. This publication, under the able editorship of Mr. J. Grene Barry, J.P., the Hon. Secretary of the Section, has been very well received. The year has been one of heavy outlay, and the balance has disappeared from the credit side of the account, but it is hoped not permanently. Besides issuing the Journal free to all members at date of publication, your Committee spent a considerable sum on each of the following, viz.:—last Annual Meeting, organizing the Archæological Section, constructing and furnishing a photographic

dark room, properly lighting the board-room for Club meetings, and making its walls suitable for displaying diagrams, &c., all of which seems money well spent and calculated to prove of great benefit. Printing and posting separate notices of each meeting to all members has been discontinued, and will result in a great saving under these heads. Arrangements have been made by which the Club has taken over the full control of this board-room from the Trustees of the Savings Bank, so far as the right to occupy and sublet it is concerned, a plan which your Committee believe likely to prove of advantage to the Club financially.

"The following meetings and excursions have taken place during the past year :—

MEETINGS.

January 14—Annual meeting.

February 23—"Bogs and Bog-Bursts, with special reference to the recent Kerry Disaster." By R. Lloyd Praeger, Esq., M.R.I.A., &c., Vice-President Dublin Field Club.

March 31—A general conference on the work of the three sections represented in the Club—Natural Science, Photography, and Archæology.

April 27—"Limerick During the Reign of Queen Elizabeth." By Mr. J. Grene Barry, J.P.

November 2—"York and its Minster." By Rev. W. E. Bentley, M.A.

November 16—"Lantern-slide Making." Contributed by *The Amateur Photographer*.

December 8—"Mosses and Liverworts." By Rev. C. H. Waddell, B.D., Vice-President Belfast Field Club.

December 14—"Eugene O'Curry," by Rev. T. Lee, A.M. "Adare and its Ancient Monastic Buildings," by Mr. G. J. Hewson, M.A. "Notes on Ara," by Rev. J. F. Lynch, M.A.

EXCURSIONS.

May 20—Askeaton.

June 17—Finlough.

July 22—Broadford.

September 3—Lough Gur.

„ 22—Finlough (by invitation).

"Meetings and excursions have been well attended and successful.

"Your Committee recommend an alteration in Rule 3, so as to provide for seven ordinary members on the Committee, and that the rules be harmonised with the enlarged object of the Club."

Mr. Beauchamp, in moving the adoption of the report, said he could not refrain from referring to the great progress the Club had made, their numbers having increased to 240. He was sorry that they were at the wrong side of the financial account, but he trusted they soon would have a balance to their credit (hear, hear). The officers deserved a great deal of praise for all they had done, and especially in promoting the Photographic Section.

County-Inspector Hayes said that he would take up their time only to endorse what Mr. Beauchamp had said, and to second the adoption of the report.

The report was passed unanimously.

Mr. Neale said it appeared from the Treasurer's report that he had fourpence in hands (laughter), but with the immediate prospect of getting in subscriptions from between 200 and 300 members he thought the Club would soon be in a healthy financial condition (hear, hear).

The following executive was appointed for the ensuing year:—

President—Dr. W. A. Fogerty; Vice-Presidents—Mr. R. D. O'Brien and Mr. James Frost, J.P.; Hon. Treasurer—Mr. Jos. Stewart; Committee—Mrs. R. Gibson, Miss Ebrill, Mr. B. Barrington, Rev. W. E. Bentley, Rev. T. Lee, Adm., Mr. P. J. Lynch, C.E., and Mr. J. F. G. Windle, C.E.; Hon. Sec. Photo Section—Dr. G. Fogerty; Hon. Sec. Archæological Section—Mr. J. Grene Barry, J.P.; Hon. Sec. Natural Science Section, and also General Secretary—Mr. F. Neale.

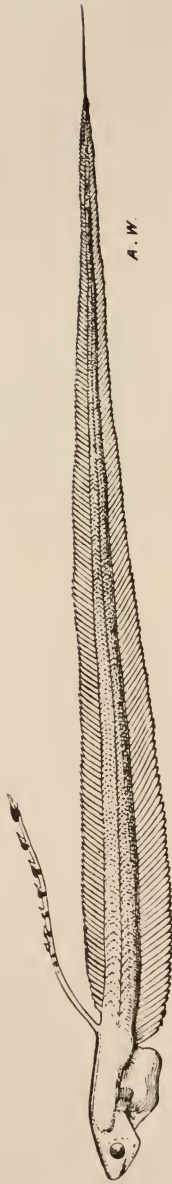
Mr. Neale proposed, and it was adopted unanimously, that a vote of thanks be passed to *The Amateur Photographer*; to the Trustees of the Savings Banks, to Mr J. Lizar, and Mr. Welch, of Belfast, and to Professor A. Haddon, of Dublin, for loans of instruments, &c.; to the Photographic Section of the Club, and others who contributed to the success of the evening.

DUBLIN NATURALISTS' FIELD CLUB.

DECEMBER 7.—The President (Prof. GRENVILLE COLE, F.G.S.) in the chair. The Rev. C. H. WADDELL, M.A., B.D. (of Saintfield, Co. Down), was present as the Delegate, from the Belfast Field Club, of the Irish Field Club Union, and gave a lecture on Mosses and Liverworts. The lecturer mentioned the advantages associated with the collection and examination of these groups of plants. By means of lantern slides and diagrams lent, for the most part, by the Royal College of Science, the life-history of the groups, points of interest in structure and habitat were fully described. A vote of thanks proposed by A. V. Jennings, F.L.S., and seconded by D. M'Ardle was heartily passed. Mr. Waddell expressed the hope that some members of the Club would join the British Moss Exchange Club (which he had founded), to help beginners in the study of mosses and for the exchange of specimens. Several books were recommended, including one by Sir E. Fry, the President of the Irish Land Commission Inquiry Commission.

Messrs. G. Coffey, M.R.I.A., Bryan J. Jones, E. Gallagher, and Miss O'Hara were elected members. Three candidates for election, and the officers and Committee for 1898 were nominated.

After expression of thanks to Mr. Greenwood Pim, M.A., for taking charge of the lantern, the meeting ended in a much enjoyed demonstration by Mr. Waddell of the many fresh mosses and liverworts he had collected for the meeting.



POST-LARVAL *FIERASFER*.
FROM A PREPARATION.

NOTE ON A POST-LARVAL FIERASFER.

BY PROFESSOR W. C. M'INTOSH, M.D., LL.D., F.R.S.

[Plate 2].

AMONGST the fishes no more curious forms occur than those which are commensalistic in the bodies of other animals. They are found, Dr. Günther tells us, in the Mediterranean, Atlantic, and Indo-Pacific seas. Foremost in interest is the genus *Fierasfer*, the Mediterranean species of which form the subject of one of the beautiful monographs (by Prof. Carlo Emery) issued by the Naples Zoological Station.¹ In this work the author mentions *F. acus* as frequenting *Holothuria tubulosa* and *Stichopus regalis* in the Mediterranean. The former species also gives shelter to *F. dentatus*. Other species have elsewhere been found in *Meleagrina margaritifera*, and it has happened that a dead example has, like the Chinese josses, been fixed to a valve by the pearly secretion, and also in *Asterias globosa* and *Culcita*, in which Doleschall says the fish betakes itself to the stomach. In holothurians the fishes appear to frequent the cloaca and respiratory passages, probably giving their host no more inconvenience than the Pea-crab does the Mussel, or *Nereilepas* the Hermit-crab. Emery observes that it may seek such a position for shelter from predatory fishes, just as the earthworm takes to the ground, or, as we should say, just as *Amphioxus* and the Sand-eel take to the sand. The genus *Fierasfer*, however, is less modified in external appearance than *Encheliophis*, another commensalistic form in which the pectorals as well as the ventrals have disappeared.

Fierasfer seems to introduce itself—tail first—into the cloaca of the holothurian at the moment of the issue of the excurrent stream of water, and keeps its head to the incurrent stream when in position—for respiration and it may be for food. The latter consists of crustaceans such as schizopods, which it appears to procure in a free condition.

Prof. Emery considers that a mass of floating ova in mucus 83 mm. long by about 41 mm. in diameter belongs to *Fierasfer acus*. Towards maturity the eggs show groups of dull yellowish oil-globules, which, as in the Sand-eel and other

¹ Le specie del genere *Fierasfer* del Golfo di Napoli; Leipzig, 1880.

forms, by-and-by coalesce into a single large globule. The larval fish carries the latter at the anterior part of the yolk-sac just beneath the heart, and the cephalic flexure is marked, though it may have been somewhat increased from premature birth or abnormal surroundings. Dark-brown pigment-corpuscles are scattered on the head and along the body to the vent, some occur on the yolk-sac, and a few at intervals along the ventral edge of the notochord to a more distinct series in the caudal region. The dorsal (marginal) fin is interrupted—at a point over a vertical cutting off the posterior third of the yolk-sac—by a papilla which indicates the future filament, the edge of the marginal fin dorsally and ventrally is serrate, a feature not due to injury, but characteristic of this form. The notochord appears to be unicolumnar in the drawing, but further investigation is necessary on this point.

The next stage, which is about 2.8 mm. in length, shows considerable elongation of the body, a shrinking of the yolk, the carrying of the oil-globule backwards, and a great increase of the dark brownish pigment over the head, body and yolk-sac as far as the vent. The dorsal filament projects as a long papilla. The increase in the length of the latter with its distal expansion, and the opening of the mouth are the next changes. Then the process elongates still more, presents secondary papillæ and a long terminal flabellum with dark pigment on the expanded part—composed of connective tissue and skin. The eyes also show dark pigment. The increase in the filamentous dorsal process and its appendages is remarkable, the whole being little short of the length of the fish and giving it a striking appearance. It was, indeed, called by Gasco, *Vexillifer De Filippi*. Emery figures one with ten processes on the filament in February. The basal part of the filament becomes stiff, and from it the long, flexible, tasselled distal region floats backward. The pectoral fin is rounded. The peritoreal surface develops much dark pigment.

The function of the remarkable dorsal appendage is not easily explained. It may be a sensory organ or a lure during pelagic life, or may be a protective resemblance to certain pelagic coelenterates. It by-and-by disappears by absorption or otherwise, the adult form having been found by Prof. Emery at 85 mm. A trace of the structure, perhaps, is seen

in "a short stout spine, the point of which alone is uncovered with the skin" (Couch)² on the dorsal ridge in *F. dentatus*.

No larval or post-larval example of *Fierasfer dentatus* has been described, for Prof. Emery's example was 205 mm. in length. The adult is distinguished by its dentition and the presence of fin-rays in the caudal region.

The specimen which has given origin to these remarks was procured by Miss Delap, whose captures of rare marine forms are familiar to many zoologists, at Valentia, on the south-west coast of Ireland, and kindly forwarded for examination by Dr. Scharff, of the Science and Art Museum, Dublin. It occurred in the tow-net in September, and measures 76 mm. in formaline. It was a post-larval form, though from the peculiar whitish opacity of the abdomen it might be imagined yolk was present. No teeth were yet developed in the jaws, and therefore the species was in contrast with such forms as *Aphia*, in which they are precocious. The head and abdomen formed the deepest and widest part, the body being nearly uniform in diameter for some distance behind, and then tapering to a hair-like tail marked by pigment-dots both dorsally and ventrally. The notochord appeared to cease at the commencement of the most filamentous portion, which had no fin-rays. The development of the fin-rays of the dorsal and anal fins is remarkable, the fish probably using them more or less as levers in the body of its host, and in going into the aperture tail foremost. The fin-rays form a regular series of slender parallel rods which become fibrous and flexible at the tip and spread out a little, the whole invested by the cellular skin, and forming a continuous web. The spine is opposite the point of the serrature of the fin. In the adult *F. acus* the fin seems to be proportionately less developed than in the post-larval stage, but the spine is very tough, and is hollow at the base. The ossific tissue forms an investment for the cellulo-granular contents. The central cavity disappears towards the tip, which breaks up into fibrillæ. The rays in the ventral fin are longer than in the dorsal, but in the latter the intermediate tissue is thicker at the base—probably due to development of connective tissue. Towards the tail the backward slope of the rays is greatly increased, so that the terminal ones form a very small angle with the notochord.

The dorsal filament springs from an elevation, and the axis of the smooth basal region appears to be cartilaginous. There are nine pigmented processes, but the first three are small. The last (most distal) has the proximal three-fourths thicker and deeply coloured with pigment, the distal region being pale and flattened, with the terminal edge bevelled from above downward. They thus agreed with Dr. Emery's figure 10, tav. ii., from the larval form of *Fierasfer acus*, though possibly *F. dentatus* may show a similar condition.

No example of *Fierasfer acus* appears to have been procured in Britain, but one or two specimens of *F. dentatus* have been got on the west coast of Ireland, and Mr. T. Edwards, of Banff, found several young forms, in March, about 5 or 6 inches in length near the shore on sandy ground. The Moray Frith is rich in holothurians, and in other respects it is a suitable habitat, for in this area southern forms occur which are elsewhere absent on the eastern shores. Mr. Boulenger had kindly examined two of these in the British Museum. The largest is 79 mm. long. A low conical tubercle exists in front of the dorsal fin, but apparently no distinct spine. The anterior canine-like teeth are very prominent. The tail ends in a hair-like process. Only a few spots of pigment occur on the head in the preparations. The absence of teeth in the Valentia specimen would indicate that it belongs to a different species from those in the British Museum, and therefore probably to *Fierasfer acus*, a form hitherto absent from Britain. The early appearance of such prominent teeth in the post-larval Teleosteans would lead us at least to expect a trace of their presence at 76 mm., especially since they are so characteristic at 79 mm. In any case the occurrence of this stage in the development of *Fierasfer* at Valentia is most interesting, and it is to be hoped that the eggs may yet be obtained in that region.

University of St. Andrews, Scotland.

AN ENTOMOLOGIST AT BALLYBUNION, CO. KERRY.

BY H. K. GORE CUTHBERT.

The watering-place of Ballybunion in North Kerry, which I visited in August, 1897, may be considered a spot of more than trifling interest to a naturalist. Lying at the southern corner of the Shannon estuary, close to some of the finest cliff-scenery in Ireland, there is always a good chance that things of interest may be picked up among its peat-bogs and sand-dunes, or the recesses of its rugged headlands.

The geology of the district presents several striking features. The village lies at the north-west corner of the plain of Listowel, as described by Mr. F. J. Foot in the Geological Survey Memoir. The following sentences are quoted from this:—"The greatest elevation lying north of the plain is Knockanore Mountain, 880 feet above sea-level. North of Knockanore the ground, rather irregular in form, slopes from 880 to 350 feet in one mile and a half. The western slope is the same for the same distance, the ground being then nearly level, till it ends in the picturesque cliffs north of Ballybunion, the average height of these being 140 feet, and the range 100 to 200 feet. South of Knockanore the elevation decreases rather abruptly to about 100 feet, and ends next the sea in an undulating series of sand-hills, extending for two miles and a half to the estuary of the Cashen River, the name under which the Feale is known for the last four miles of its course."

South of the village, from the sand-hills northward, the rocks are Carboniferous limestone, a large reef of this formation projecting from the strand and running far into the sea. It is mainly uncovered at low water, and contains many pools abounding with sea-anemones. The junction of the limestone with the shales and grits forming the Coal-measures, so distinctive of North Kerry geology, is well shown just below the ruins of Ballybunion Castle, and these beds form the line of cliffs as far as Dooneen Point, about six miles from the village. They are excessively crumpled and contorted, and have been cut up by the sea into numerous bays.

The action of the waves has formed numbers of caves, sea-stacks, and natural arches ; and in some places blow-holes or spray-pipes. One very pretty peculiarity of this coast is due to the cascades formed by the streams, which fall over the cliffs perpendicularly to the shingle below. Near one of these is shown a resting-place of those early tourists, Diarmuid and Grania.

To an entomologist the most attractive portion of this region is covered by the sand-hills, the peat-bogs of Knockanore, and the grassy glens of the Glennachoor, Carrigarone, and Kilconly rivulets. Prominent among the wild flowers of North Kerry is the Common Ragweed or *Bohalaun*, most abundant of plants—an unlovely sight to agriculturist or botanist, but a mine of wealth to the insect-hunter. These masses of flowers yielded Diptera in abundance ; also many Hymenopterous species, including several of the solitary and social bees, with their allied parasitical genera ; and a profusion of sand-wasps in eager quest of the flies and spiders on which they prey. The latter were also abundant on *Umbelliferae* on the sand hills, with several of the commoner ants. The slopes of Knockanore yielded various interesting members of the same Order, being particularly rich in humble bees, at least as to specimens, if not species. The tracts of heather (Ling) around the top of the mountain were also swarming with hive-bees, honey being abundant everywhere in the district.

The glens or narrow valleys of the Glennachoor and other streams gave the collector other Hymenoptera from flowers of Hawkweed and Knapweed, Bramble and Scabious. These include various solitary *Apidae*, and small bees of the general *Halictus* and *Sphecodes*. These sheltered spots are also the home of many butterflies of the coloured kinds, especially the Peacock, the Small Copper, and the Grayling.

Beetles were not scarce wherever sought for, although most of those taken were common things. Knockanore, as the only elevated ground of any importance, naturally claimed most of a coleopterist's attention. The most abundant species here were a ground-beetle, *Nebria Gyllenhali*, and a heteromeron, *Helops striatus*. Both simply swarmed over every part of the mountain. Many small rove-beetles find shelter under and near the peat-stacks, dotted over the mountain sides and summit ; and many weevils find cover,—with the companionship

of ants,—under stones and sods in the heather. Several species of course are confined to the sand-hills, although a collector misses some (*Lacon*, *Heliopathes*) that are familiar on the east coast, whilst others (*Metabletus*, *Palorus*), not common or not occurring in the east, may be taken here. A curious feature was the apparent absence of *Carabi*, notably on Knockanore, a spot which would seem to be suitable to them.

The weather unfortunately was unfavourable, being wet and stormy during much of the writer's visit. This seriously hampered collecting, and prevented the pursuit of another object,—the exploration of the caves. Other things, not connected with the weather, made it hard to judge the full entomological possibilities of the place; but enough material, even in an August holiday, was gathered to show that Ballybunion may have other features and attractions than its bracing air and rolling surges, its sands and links, caves and cliffs, not to speak of the most valuable factor of all, its courteous and kindly inhabitants.

INSECTS COLLECTED OR OBSERVED.

Lepidoptera.


Butterflies only were noted or collected.

<i>Pararge egeria</i> .	<i>V. cardui</i> .
<i>P. megaera</i> .	<i>V. urtica</i> .
<i>Satyrus semele</i> .	<i>Chrysophanus phlæas</i> .
<i>Argynnis aglaia</i> .	<i>Polyommatus icarus</i> .
<i>Vanessa atalanta</i> .	<i>Epinephile janira</i> .
<i>V. io</i> .	<i>E. tithonus</i> .

Colias edusa, abundant in parts of the South during the summer and autumn, was not observed.

Hymenoptera-Aculeata.

Forty-one species were taken, most noteworthy being:—

<i>Formica fusca</i> race <i>cunicularia</i> .	<i>Andrena analis</i> .
<i>Leptothorax acervorum</i> .	<i>Nomada jacobææ</i> .
 <i>Salix exaltatus</i> .	<i>Celiogys simplex</i> .
<i>Pemphredon Shuckardi</i> .	<i>Psithyrus rupestris</i> .
<i>Vespa sylvestris</i> .	<i>Bombus smithianus</i> .
<i>Colletes picistigma</i> .	<i>B. sylvarum</i> .
<i>Sphecodes similis</i> .	<i>B. derhamellus</i> .
<i>Halictus leucopus</i> .	<i>B. venustus</i> .

Some of these, which are additions to the Irish list, have already been recorded in the *Irish Naturalist*.

Coleoptera.

One hundred and ten species, chiefly *terrestria*, were collected. For the determination of the great bulk of these the writer is indebted to the kindness of Mr. J. N. Halbert. In the following list only the less commonly distributed species are noted:—

<i>Notiophilus palustris</i> .	<i>Lesteva longelytrata</i> .
<i>Dyschirius æneus</i> .	<i>Choleva cisteloides</i> .
<i>Bradycellus cognatus</i> .	<i>C. grandicollis</i> .
<i>B. distinctus</i> .	<i>C. fusca</i> .
<i>B. harpalinus</i> .	<i>C. Watsoni</i> .
<i>Amara apricaria</i> .	<i>Ptomaphagus sericeus</i> .
<i>Calathus melanocephalus</i> var.	<i>Apion cracca</i> .
<i>nubigena</i> .	<i>Otiorrhynchus blandus</i> .
<i>Taphria nivalis</i> .	<i>O. ligneus</i> .
<i>Bembidium saxatile</i> .	<i>O. rugifrons</i> .
<i>Dromius nigriventris</i> .	<i>Cænopsis Waltoni</i> .
<i>Metabletus foveola</i> .	<i>Barypeithes sulcifrons</i> .
<i>Haliphus obliquus</i> .	<i>Brachysomus echinatus</i> .
<i>Conosoma pubescens</i> .	<i>Sitones lineellus</i> .
<i>Othius lacviusculus</i> .	<i>S. hispidulus</i> .
<i>Tachyporus nitidicollis</i> .	<i>Hypera polygoni</i> .
<i>Megacronus analis</i> .	<i>Curculio abietis</i> .
<i>Mycetoporus splendidus</i> .	<i>Grypidius equiseti</i> .
<i>Philonthus proximus</i> .	<i>Tychius tomentosus</i> .
<i>P. vernalis</i> .	<i>Gymnetron pascuorum</i> .
<i>Cafius fucicola</i> .	<i>Anoplus plantaris</i> .
<i>Lathrobium quadratum</i> .	<i>Palorus melinus</i> .
<i>Stenus guttula</i> .	

Of these, *Tychius tomentosus*, Herbst., *Gymnetron pascuorum*, Gyll., and *Palorus melinus*, Herbst., are new to the Irish list. The two former were taken under stones at the mouth of the Cashen river, and the latter under the bark of a paling on the golf-links.

Cænopsis Waltoni, Schön., and *Sitones lineellus*, Gyll., are rare or very local species in Ireland.

Metabletus foveola, Gyll., which the writer had but once previously taken in Ireland, was very abundant both on the sand-hills and on Knockanore. A notable feature of the coleopterous fauna was the great abundance of the large rove-beetle, *Staphylinus casarius*, Cederheim.

Blackrock, Co. Dublin.

NOTES ON THE INTRODUCTION OF THE BROWN HARE INTO IRELAND.

WITH ADDITIONAL REMARKS ON OTHER INTRODUCTIONS OF HARES, BOTH BROWN AND BLUE, IN THE BRITISH ISLES.

BY G. E. H. BARRETT-HAMILTON, B.A.

THE publication of Dr. Scharff's remarkable and suggestive paper¹ "On the Origin of the European Fauna," wherein he alludes (pages 435 and 471) to the frequent attempts made by sportsmen to establish the Brown or English Hare (*Lepus europæus*, Pall.), in Ireland, reminds me that I have for some time been under a promise to him to publish the notes which I possess on this subject. For these I am largely indebted to the kindness of several of my correspondents, who have taken considerable trouble to help me in the collection of information, and to none more so than to my friend the late Mr. E. G. Pennington.

My notes² lay no claim to completeness, but a series of inquiries extended over a course of several years has failed to add to them, and I, therefore, think it best to publish them as they are, knowing as I do, that they may be of use to those who like Dr. Scharff are trying to unravel the mysteries of our fauna and flora. They are, at all events, amply sufficient to prove the possibility of permanently establishing the English or Brown Hare in Ireland.

CO. ARMAGH.

English Hares are said to have been established in Lord Lurgan's Park at Lurgan for over thirty years, and my informant, who has had over twenty years experience of them, states that he never knew them to interbreed with the Irish Hares. Their quality was considered much above that of the latter. Lord Lurgan has very kindly corroborated this (*in lit.* of Dec. 31st, 1897), and informs me that "in former days there were a great many" of these hares at Lurgan, and that they did very well there. Lord Lurgan says that some of the English Hares were turned down inside a walled demesne, and a few others outside. In both cases there were large quantities of Irish Hares on the ground.

¹ *Proc. R. I. Acad.*, 3rd ser., vol. iv., No. 3, July, 1897.

² The present paper includes, amplifies or corrects a few notes on the same subject which appeared in the *Irish Sportsman* newspaper of 19th, September, 1891 (p. 486), and in the volume of the "Fur and Feather Series" on the Hare (Natural History by Rev. H. A. Macpherson), at page 7 (1896).

Co. CORK.

I am indebted to my correspondent, Captain J. J. Dunne, for the information that many years ago the late Mr. Hyde turned down many English Hares at Castle Hyde, near Fermoy. These were at least not quite failures, for Captain Dunne saw their descendants years after in Connamore. Other correspondents corroborate this information, and add that the introduction took place about forty years ago, and that the exact locality was at Cregg North demesne, near Castle Hyde. "They throve and bred with the Irish Hares, but, as after a few years proper steps were not taken to preserve the hares [they] were killed from time to time, and for the past twenty years no English Hare has been seen, and there are now very few hares of any breed in either locality."

The last paragraph also applies to an introduction of English Hares, which is stated to have taken place about fifty years ago in the neighbourhood of Ballyhooley, and for which the Listowel family were responsible. This information reached me through Mr. E. A. Pennington, and, as at Castle Hyde, the introduced animals bred and throve well until they were killed off by man.

The father of the present Lord Clonbrock was informed by the late Lord Shannon, about the year 1852, that he had brought in English Hares to Castlemartyr, Co. Cork, and that they were doing well, but Lord Clonbrock does not know how long they survived, though he heard a year or two ago that another introduction was going to take place at Castlemartyr, which looks, as Lord Clonbrock remarks, as if the experiment had at least partially succeeded.

English Hares were introduced at the Trabulgan (Co. Cork) Coursing Grounds, by Lord Fermoy.

With regard to these hares, the following interesting letter was written by Lord Fermoy to the *Field* of April 14, 1888 (p. 527):—"In the year 1882 I imported a number of hares from Elvedon, and put them down at Trabulgan. For two seasons they were coursed with the Irish Hares at Trabulgan. I took great interest in these English Hares, and made up my mind that they went faster than the Irish Hare until the dogs reached them. This is very easily accounted for, as they are much larger animals than the Irish Hare, and cover more ground in their stride; but after the dogs reached them they were not nearly such good animals as the Irish Hare, as the latter turns in so much smaller space, is so much quicker off the turn, and is so very stout-hearted. She is never beaten until the greyhound has her in his mouth. On one occasion I heard an Irish trainer say to another at Trabulgan, at the end of a stake, 'I hope I'll get one of them English hares, as my dog can go the fastest; but he will be bate if it comes to working.'

"A few years since I sold one hundred Irish Hares to the Gosforth Park Coursing Committee, and I believe these Irish Hares there proved how hard they were to kill, and how stout-hearted.

"The English and Irish Hares remind me very much of the Red and Fallow Deer in the way they live. Everyone knows that the Red and Fallow Deer will not feed together. It was most curious at Trabolgan to observe in the large fields how the English and Irish Hares sat apart, and appeared never to make friends. I regret to say I have lost all my English Hares, as I was most anxious to see whether after a time the two species would cross, and combine the speed of the one with the stoutness and great working power of the other. I have tried to procure some hares from England, but have, unfortunately, failed up to now. I am still most anxious to procure some, as I do not despair of the two species crossing and am anxious to continue to observe how the English and Irish hares acquit themselves in the coursing field."

CO. DONEGAL.

The following appeared in *Land and Water* of March 4, 1893, over the signature of "Highlander"—a well-known contributor of that journal:—

"Not long since English Hares were turned down in Donegal by Mr. Olphert, of Ballyconnell, and so well have they thrived and increased that I hear other landowners are likely to follow his example. It seems, however, that English Hares are only suitable to certain parts of Ireland, for when introduced in the neighbourhood of Dingle some years ago, I understand that they were a complete failure."

Mr. John Olphert has, however, very kindly informed me, in a letter dated November 5th, 1895, that he has not introduced any English Hares at Ballyconnell, though he has been wishing very much to get some hares to turn out here of any kind.

CO. DOWN.

"The late David Kerr, Esq., upwards of thirty years ago had some hares brought from England, and turned out on the largest of the three Copeland Islands, off the coast of Down, where, however, they did not much increase, and long since became extinct?" (Thompson, *Nat. Hist. of Ireland*, vol. iv., footnote to p. 19).

CO. FERMANAGH.

I am indebted to Sir Douglas Brooke, of Colebrooke, Co. Fermanagh, for some interesting particulars of an introduction of Brown Hares at Cleenish Island, in Lough Erne. This island belongs to Captain Collum, and there are on it both Irish and English Hares. Sir Douglas Brooke wrote me that the latter had taken up a separate corner of the island to themselves (*lit.* of 20th March, 1891). Captain Collum (*in lit.* of 11th April, 1891) very kindly informed me that he had no experience of Scotch hares, but that the English hares which he "imported usually kept distinct and separate in droves, but there is no doubt but in some instances there was a cross (*sic*). The Blue mountain hares made a good cross with ours." I do not understand what Captain Collum means by the "Blue mountain hares," but perhaps he means hares from the Irish mountains—certainly he distinctly states that no Scotch hares were introduced. I have no very recent information about these hares,

though Sir Douglas Brooke wrote me in November, 1896, that he had heard that hares of both kinds were nearly extinct on Cleenish Island but did not know if it was a fact or not.

Under date of November 17th, 1895, Sir Douglas Brooke wrote me that he "killed an English Hare, after a real good run, early in March this year; she was in very fine condition in spite of the winter, though on the same day we picked up two dead Irish hares. This was close to Kesh, and I cannot find any record of any English Hares having been turned out anywhere near."

CO. GALWAY.

In *Land and Water* of March 7th, 1891, Mr. G. H. Kinahan wrote of "big English imported" hares, "the largest I used to meet being in the Salrock district alongside Killary Bay. These hares were introduced by the Martins, General Thompson and others. They are found in the valleys, but in general do not go up into the mountain heights, except during a drive."

Mr. Kinahan's remarks, both in this letter and one contributed to *Land and Water* of February 25th, 1893, are more vague than one could have wished, and further inquiries that I have made in the district (and in which I have been kindly assisted by Mr. Kinahan) have failed to throw any light on the matter.

CO. LONDONDERRY.

Not more satisfactory are the statements of my correspondent, Mr. A. J. Collins, that some hares are said to have been introduced in Londonderry by a Mr. Stevenson (*in lit.* of January 5th, 1893), and of Captain J. J. Dunne, that "the Woodland hare has often been introduced into Ireland. At Ballogin (Sir C. Coote's), Fookes, an English keeper turned down twenty couple, forty years ago. They did not do."

The above report that English Hares were introduced in Co. Londonderry by Mr. Stevenson, appears to have arisen out of confusion with the introduction of Scotch hares at Black Brae in that county (*vide infra*, page 76).

CO. TYRONE.

In *Land and Water* of March 4th, 1893, Mr. John Herdman wrote as follows:—"I turned out a large quantity of English Hares here in 1876 and 1877. A pack of harriers formerly kept in this district (Strabane) had been dropped, and hares became extinct. This country has been constantly hunted since 1876, and we have a splendid stock of hares." On 22nd February, 1896, Mr. Herdman wrote to Mr. Pennington that the English hares, of which sixty-five had been brought over from Norfolk in 1876 were "still in great numbers. We also laid down a great many small dark Irish hares, but they all left us and went to the mountains. They don't appear to me to interbreed with the Irish hare, as they make their homes altogether in the lowland and cultivated

country, and lie in the middle of all the fields." When these hares were introduced "there was not a hare in the country except in the mountains."

Lord Clonbrock informed me (*in lit.* of Feb. 9th, 1892), that English Hares were introduced at Baronscourt, Co. Tyrone, by the late Duke of Abercorn, from whose lips he had obtained this information about the year 1876. Lord Clonbrock, however, never saw an English hare there that year "nor heard of one as having been seen for some time previously, nor was there any difference perceptible in the hares there from the ordinary hare. There was an attempt made to trace cross-breeding in one hare which I shot, from the length of the ears, but the difference, if any, was very slight, and the colour of the hare was that of the Irish Hare."

CO. WICKLOW.

English Hares have been introduced at Powerscourt, in the Co. Wicklow, and Lord Powerscourt has very kindly sent me the following information, which I quote from a letter received from him, and dated November 3rd, 1895, viz., "The only information I can give you as to the English hares is that about 1865 or '6, Mr. Edward Heneage, of Haniton Hall, Lincolnshire, now the Right Hon. Edward Heneage, sent me about forty English Hares to turn out at Powerscourt. These came in boxes or crates, ten in a crate, and were turned out in the Park at Powerscourt near the house.

"It was found by my keeper a few days afterwards that all the hares were blind. They ran up against trees and fences, and could not see, and they all died. After this (a very extraordinary thing) Mr. Heneage sent me forty more, but then we had boxes made so that each hare travelled in a separate little compartment to itself. These hares arrived all safe, and were turned out and did well, and bred—so much so that two years afterwards we killed over 200 in a day.

"There has not been any fresh importation of hares since that, and I am afraid they have bred in and in, and there are very few now These hares never, to my knowledge, crossed with the Irish Hares, but there were no Irish Hares in the demesne at Powerscourt, although we have plenty on the mountains some three or four miles off. But the English Hares have never spread, so much as to get to the mountains, and have never even crossed the Dargle river, which they could easily do, as the river is small and there are several bridges, and also if any of them had got out of the demesne they could have got to the mountains. But they do not seem to wander far. I must get some fresh hares from England, and, perhaps, they will then wander more, but they have not much chance when they get out of the preserved ground, as the farmers' dogs kill them The English Hares I have are quite free, and if they chose, could cross the river and get out of the demesne, but they do not seem to do so much, although, when there were more of them, I did hear of a few being killed outside the demesne, and once saw one hanging in a poulterer's shop in Dublin."

In the memoir alluded to above, Dr. Scharff remarks that "the difficulty of establishing the English hare permanently" in Ireland, "is altogether unconnected with climate or food," and that he believes that the distribution of the two species in Europe generally seems to indicate that they will not live together (*op. cit.* i., pages 435 and 471).

If this be so, and if, as Dr. Scharff believes, the English Hare is probably the stronger of the two species, then, all other things being equal, we should expect introductions of the English Hare into Ireland to be extremely successful, since in that country, not only is the native hare a presumably weaker species, but whole tracts of country are quite without hares at all.

On analysis of the twelve instances of the introduction of Brown Hares into Ireland, of which I have been able to give some particulars, this is found to be the case. Of these introductions ten may, I think, be regarded as authenticated—viz., those which took place at Copeland Island, Trabulgan, Powerscourt, Cleenish Island, Strabane, Castle Hyde, Fermanagh, Baronscourt, Castlemartyr and Lurgan. On further examination, however, it is at once evident that in several instances the imported animals were never really given a fair chance of establishing themselves in their new homes, and particularly in the case of Copeland and Cleenish Islands, where the hares were confined to a narrow space, and probably also artificially fed. At Trabulgan the hares were imported expressly to be killed by coursing; at Powerscourt they were either injured in the transit to Ireland, or were killed as soon as they left the protection of the demesne, and similarly in most of the remaining instances their extermination was only brought about by man himself. Yet, in spite of the efforts of their enemies, whether legal or illegal, to destroy them, we have evidence—in many of the cases which I have cited—of their power to become permanently established when given a fair chance, and the success of the Strabane introduction is alone a sufficient proof of this.

The refusal of the English Hares to associate with the Irish species as reported in more than one instance, is of interest, and tends to support Dr. Scharff's views that the two species are antagonistic, and that the Brown Hare being the stronger

of the two, has driven the other out of the European plain into the mountains. This supposition is further supported by the behaviour of the two species in Scotland, where their respective ranges meet.

"The Brown Hare and the White Hare in Scotland,"¹ writes Mr. Harvie-Brown, "rarely are found upon the same kind of ground, the Brown Hare being quite an inhabitant of agricultural and wooded low-land areas. A few Brown Hares are found in higher-lying cultivated valleys, but rarely or never increase in such localities. Our low-land moors, such as the central hills of Stirlingshire, and the lower grouse moors, hold Brown Hares to the exclusion or almost exclusion of the White or Blue Hare. We have a few Blue Hares here as low down as 600 feet, but they don't increase, and, indeed, they disappear from time to time. The two kinds of ground are suited to the two species, and neither species obtrudes itself to any extent upon the other's territory except in excessively severe and snowy winters like 1894-95, or excessively dry and warm summers like 1893."

At all events Dr. Scharff's suggestion provides a very good working hypothesis, which may be fairly taken to explain the distribution of the two species of hares in Europe until some better one is forthcoming. I expect, however, that the antagonism between the two species may not have been an active one, but that the Brown Hare simply crowded the Blue Hare out, except in localities such as those found on higher and barer ground, which are unsuited to it. In localities, such as islands, where there are no Brown Hares, the Blue Hares are found at sea level, as in the Hebrides and Ireland, and in the absence of the other species, hold their own well. In the South of Scotland, as I am informed by Mr. Robert Service² they have been introduced, and were still increasing their range when he wrote (*vide infra*).

In conclusion, it may be interesting to give some notes on the results of introductions of the Irish Hare into Great Britain, or of the Scotch Mountain Hare into Ireland or Wales.

INTRODUCTION OF IRISH HARES INTO GREAT BRITAIN.

Irish Hares have been successfully introduced into the Island of Mull, where it is said that there were originally no native hares. Here they thrive very well side by side with hares from the mainland of Scotland. For these and other interesting particulars as to hares in Scotland, I am indebted to the kindness of Messrs. C. H. Ackroyd, J. A. Harvie-Brown, T. E. Buckley, and Robert Service.³

¹ *In lit.* of July, 1895.

² *In lit.* of November 18th, 1895.

³ See also "A Vertebrate Fauna of Argyll and the Inner Hebrides," pp. 41-44.

At Vaynol, near Bangor, North Wales, Irish, Scotch, and English hares all do well, although Mr. G. W. D. Assheton-Smith informs me that neither of the former seem to associate with the latter species. At Vaynol the Scotch hares are on the hills and the Irish in the park.

Finally, there is Lord Fermoy's statement (*supra*, p. 70) that Irish hares have been turned down on the coursing grounds of Gosforth in England, regarding which Mr. T. Snowden, lately Secretary to the Gosforth Park Coursing Club, has been good enough to inform me that although he does not recollect that any hares from Fermoy were ever turned down at Gosforth Park, the Club had for several years a large number from the late Mr. G. G. Alexander of Dalkey, near Dublin, which were obtained from his shootings in Ireland—"none of them were the Blue Mountain Hare. They were a little smaller than our hares, and the same dun colour as a rabbit. For coursing purposes they were quite as good as our English hares. They bred within the Park (500 acres), but were not prolific. They never crossed with our Brown hares, in fact, they would not go near them, but kept by themselves as much as possible." Finally, for some years after coursing ceased to be carried on at Gosforth Park these hares were occasionally shot both in the Park and on neighbouring farms outside it, but Mr. Snowden thinks they must be now extinct as he has not heard of any having been seen lately. Corroborating Mr. Snowden's information as to the Irish hares turned down at Gosforth, Mr. N. Dunn states that they came from the Wicklow mountains.

INTRODUCTION OF SCOTCH HARES IN IRELAND AND SOUTH SCOTLAND.

Scotch hares have probably been frequently introduced into Ireland, notably at the Coursing Grounds of Black Prae, in Co. Londonderry, for which information I am indebted to the late Mr. E. G. Pennington.

In the South of Scotland, as I am informed by Mr. Robert Service (*lit. cit. supra*), "all the Alpine hares of the country south of a line betwixt the firths of Forth and Clyde are the produce of animals introduced from the North within quite recent years. They have not by any means reached the limits of their probable distribution as yet. They are still spreading annually, both lower and wider" (1895).

Brown Hares have been introduced into Harris and some of the Orkney Islands, and have in most cases done well, except where exterminated by man. In Harris and in the latter islands they have to associate with the Blue Hare—also an introduced species in Harris, but which had died out in the Orkneys, and has been recently re-introduced. Much valuable information on these and other matters connected with hares will be found in Messrs. J. A. Harvie-Brown and T. E. Buckley's volumes¹ on the Fauna of Scotland.

Kilmaunock, New Ross, Co. Wexford.

¹ See "A Vertebrate Fauna of the Outer Hebrides," pp. 38 and 39, and "A Vertebrate Fauna of the Orkney Islands," p. 86.

LAND-SHELL "POCKETS" ON SAND-DUNES.

BY R. WELCH.

(Read before Belfast Naturalists' Field Club, January 18th, 1898.)

AMONG the sand-hills in the North and North-west of Ireland one may often find large quantities of land-shells collected in little hollows or "pockets," especially at the east end of Whitepark Bay, North Antrim, and on the Portstewart dunes near the River Bann. Some of the shells in the case of the smaller species may be alive, but the great majority will be found dead, and worn thin and smooth by drifting about with the sand, any sculpturing on the shells being removed. Of these dead shells, however, some are often quite fresh and uninjured, and possibly a number may be rare and difficult to find alive. I have given the "pockets" a good deal of attention on various visits, wondering at the large number of the rarer species which it was possible to collect in this way, even in a single "pocket" a few feet square, and species too, which do not take kindly to such dry exposed places, but prefer the moisture and shelter of thick vegetation or damp mossy slopes. Visits paid during windy weather soon taught me that the shells often travelled a long way before being collected by the swirling action of the wind round the dunes into some sheltered hollow, or little plateau covered with Bent (*Psamma arenaria*), which stopped their progress while allowing most of the sand to pass through. Where the Bent was the collector, the shells were usually mixed with a mass of dead leaves, grass, beetles, &c., and here I usually found some of the shells alive.

At Whitepark they came mainly from the broad steep grassy slopes, running up from the dunes to the bottom of the cliffs which bound the bay. These mossy swards have a great variety of food-plants, and lying under the Chalk cliffs, on the Lias and Chalk talus below, damp for the greater part of the year, provide the proper conditions for an abundant shell-fauna. Few shells come out in dry weather, and especially in the day time, when they hide or burrow in moss or at roots of grass, &c.; at sundown, however, or in wet weather, swarms of them may be seen feeding all over the sward, and on the Thistles, Bent, &c., on the dunes below. It is this sudden appearance of great numbers of some species, *Helix virgata* and *H. acuta*

mainly I think, after a smart rain-shower in dry weather, that has given rise to the curious belief among peasants in the South-east of England and other places that it "rains snails" occasionally. At Ballycastle "snail showers" (!) of those two species were not uncommon before the advent of golfers on the warren, whose big feet have tramped the lives out of myriads, and reduced their numbers considerably. At Portrush, Portsalon, Great Island of Aran, and other places I have noticed *Helix ericetorum* appearing suddenly in the same way, and some other species as well, in favourable spots.

These slopes at Whitepark are much exposed, and in windy weather many of the shells are blown off their food-plants, or swept off them and the short grassy sward by heavy rain, and carried down to the desert below, where the drifting about in the sand soon ends the life of the majority, the animal forming acceptable food to the beetles and other small scavengers of the dunes, which soon clean the shells out. Many shells of course which die in the ordinary way get carried down by the same agencies, which also destroy old dunes, these latter furnish many shells from former "pockets," long since covered up by shifting sands, to swell the bulk of later ones, which might under very favourable conditions become large deposits, even though many shells are broken or ground to powder in the process.

Nice sections in old dunes now altering may be noticed at Portstewart, Castlerock, Whitepark, and Bundoran, &c. (at the latter some of the dunes are over 100 feet high); little bands of shells may be seen here and there, the shells falling out as the wind planes the section a stage further in.

I believe it is from these old layers that the fine scalariform and reversed or sinistral *Helix nemoralis* are obtained at Bundoran on the Finner sand-hills, as no collector has hitherto found a living colony there; the shells too look very much sand-planed, as with long drifting.

While the smaller Whitepark "pockets" so far yield more species, the largest I have seen are on the Portstewart dunes near the Bann, and contain also fresh-water species, though in small quantities, evidently derived from the flood debris of the Bann, a matted mass of vegetable matter with land and fresh-water shells, beetles, &c., swept from its banks and shallow margins by the river after heavy rains and thrown up

on the edge of the sand-hills where tide and river meet. I have taken seven or eight species out of this debris, and some of them also in a large "pocket" not far from the river-bank, including a fresh-water species—*Hydrobia*—in 1893. This turned out to be *Hydrobia Jenkinsi* (and a new record for Ireland¹) on the examination of more perfect specimens which I obtained alive, swarming in little brackish pools on the swampy edges of the river near there in July, 1897.

During the Field Club excursion to Bundoran and Sligo in July, 1892, Mr. Praeger collected a handful or two of drift material at high-water mark on the sand-hills at the mouth of the Erne; this yielded eighteen species of land-shells, and as no fresh-water shells likely to come from higher reaches of the river were found with them, they were all likely swept into the river from the dunes or their swampy margins.²

At Portsalon in 1893 Mr. R. D. Darbishire noticed, as he had previously done at other places, many little shells, beetles, &c., derived from debris of the river and the dunes, drifting into a little hollow in the latter, and in the *Journal of Conchology*, vol. 7, p. 196, Mr. R. Standen, who was with him at the time, describes the manner in which they saw them being collected together by the wind. From a table-spoonful of the finer material, the result of a careful sieving of about a pint which removed the sand and all shells larger than *Cochlicopa*, they obtained 476 specimens of 15 species, and several of these proved to be albino specimens (not previously known) of *Vertigo pusilla*, an exceedingly rare species. Not far from this, on the low cliffs of quartzite near the hotel, which rise about 20 feet above the sea, I noticed a few years later a mass of earthy sand containing many land-shells falling out of the thickly matted mass of roots of Ivy and Bramble with which the little cliffs are covered. There must have been tons of this material tumbling down and mixing with the marine shells on the beach below in a little gully not far above high-water mark. A quantity of this sieved and brought home yielded 18 species, a few like *Helix hortensis* and *Vertigo substriata* being local and rare, and while some of them I know live among the vegetation on the cliffs, others were carried there by the wind, with the sand from the dunes close at hand.

¹ See *Irish Naturalist*, 1897, p. 234.

² *Irish Naturalist*, 1892, p. 171.

I think that this may help to explain one way in which a large number of species of land shells might get mixed with marine species during the formation of a raised beach, such as that at Portrush, described so many years ago by General Portlock, and whose present condition Mr. S. A. Stewart notes in *Irish Naturalist*, 1897, page 287; while the small modern shell-pockets in our sand-hills may help to show how much older and larger land-shell deposits, such as the sub-fossil deposit at Dog's Bay, were formed, or a somewhat similar one found by Canon Norman on the beach at Madeira, and described in a paper he read before the Newcastle-on-Tyne Nat. Hist. Society, Nov., 1897.

This Dog's Bay deposit is closely connected with the "black band" or old sward discovered there by Mr. R. D. Darbishire in 1865, and described by him in the *Journal of Conchology*, 1885. After the Field Club Union Conference in Galway, 1895, a contingent who visited Dog's Bay daily for several days found that the "black band" was gone, but we discovered still remaining some local patches of a thicker deposit, much lighter in colour, formed by myriads of similar shells in a matrix of foraminiferous sand, finely comminuted shells and a little earthy matter.¹ (Some of us again visited the place in April, 1896, and found the little sections being rapidly destroyed by the wind, aided by cows rubbing against and tramping over them). We agreed with Mr. Darbishire that the conditions of life on and near the little peninsula must have been very different at one time to what it is at present—now, the bare sandy neck between Gorteen Bay and Dog's Bay is utterly devoid of shell life and the wind-swept areas adjoining hardly less so; while the deposit consists of masses of shells, many of which will only live where there is plenty of moisture and vegetation, as on the slopes of Whitepark. These shells may have collected from similar slopes and marshy ground then near at hand; the "black band" seems to indicate the latter, and covered by the light foraminiferous material—still present in very large quantities—in the way in which we saw it travelling far above high water mark under the influence of a westerly wind, might very quickly in a warm and moist climate like that of the West coast form such a deposit. Two of my companions, Messrs. Collier and

¹ See Mr. Standen's article, *Irish Naturalist*, 1895, page 269.

Standen, in their paper (*Journ. of Conch.*, 1896), on the shells of Dog's Bay, mention that the thick, large, and very heavy shells of *Helix nemoralis* in the lower zone, seem to point to just such favourable conditions for molluscan life.

I made a rough analysis of this deposit, and found that 87 per cent. of it dissolved quickly in hydrochloric acid, the small residue being composed of very fine quartz sand and mica, which had probably blown up with the foraminifera from the old strand.

On our Northern strands, the proportion of fine foraminiferous, &c., material is very much smaller, and though some of this finds its way to the dunes still forming, the mass of the material composing them is mainly silicious. Any calcareous matter mixed with it seems to get quickly dissolved by the percolation of rain-water through the sand; this too, as well as the drifting of the sand, probably accounts for the thin eroded shells in the old layers or "pockets." Possibly the partly solidified beds of sand present at the base of some dunes, at Portstewart and especially Portsalon, are sandstones now partly consolidating by the aid of carbonates formed at the surface in this way, which are carried down in solution and set free at the bottom, to bind the sand particles together.

In proof of this, a sample of sand from the upper part of a dune close to a strand, the surface of which was more calcareous than usual, yielded only 2·5 per cent. of carbonate of lime, the residue being silicious.

To show the richness in shells of the material, both in quantity and quality, I give the number of the smaller specimens in three ounces, sifted out of about a pint collected from the large "pocket" at Portstewart referred to.

Vertigo angustior, 158; *V. pygmæa*, 92; *V. substriata*, 47; *V. pusilla* var. *albina*, 8; *V. edentula*, 1; *Helix aculeata*, 34; *H. pygmæa*, 24; *H. pulchella* in profusion; *Hyalinia cristallina*, 18; *H. fulva*, 6; *Carychium minimum*, 28 (these out of fifty grains of the finer material); and in varying numbers, many of them being young shells, *Hyalinia alliaria*, *Hyalinia* (sp. ?), *Helix acuta*, *H. hispida*, *H. nemoralis*, *Pupa muscorum* and var. *albina*, *H. cylindracea* and var. *albina*, *Clausilia bidentata*, *Cochlicopa lubrica*, *Hydrobia Jenkinsi*—twenty-one species in all.

Mr. Lionel E. Adams collected fifty-two species in the district on both sides of the Bann in 1883, including *Vertigo alpestris*, the first and only specimen obtained in Ireland, till ten years later Mr. Standen sifted a few more specimens out of the Portsalon "pockets."

In May, 1896, I obtained about a dozen species in a series of small hollows between two dunes at east end of Whitepark Bay, and in September of that year Mr. Standen and I collected twenty-six species in the same place, including *Vertigo alpestris* alive. These he lists in the *Irish Naturalist* for January, 1897, and on the Field Club excursion there six months later an additional rare species—*Acme lineata*—was found.

With Dr. Scharff's kind assistance I listed eighteen species from the material collected from the Portsalon cliff deposit as follows:—*Vitrina pellucida*, *Hyalinia cellaria*, *H. Draparnaudi*, *H. nitidula*, *H. crystallina*, *H. fulva*; *Helix pulchella* and var. *costata*, *H. ericetorum*, *H. acuta*, *H. nemoralis*, *H. hortensis*, *H. aspersa*; *Cochlicopa lubrica*; *Pupa cylindracea*, *P. muscorum*; *Vertigo pygmaea*, *V. substriata*; *Carychium minimum*.

Belfast.

HYALINIA DRAPARNAUDI, BECK, IN NORTH IRELAND?

BY LIONEL E. ADAMS, B.A.

IN the *Irish Naturalist* for July, 1897, I included *Hy. Draparnaudi* in the list of species from Murlough and Rathlin Island. I now wish to withdraw this species, for the present at any rate, for the following reasons:—

There has been found in Lancashire and in the Isle of Man a large form of *Hyalinia* with a dark blue animal, which has been placed under the name of *Draparnaudi* by greater authorities than myself, the correctness of which I have only recently questioned. This same form our party found on Rathlin Island and at Murlough Bay, together with the typical *Hy. cellaria* with the pale-coloured animal. By the kindness of Mr. R. Welch of Belfast I have been enabled to examine a large series of specimens from Murlough, and

compare them carefully with individuals of what we know as typical *Draparnaudi* from Tenby. Now while the general appearance of the Irish animals tallies with those from Tenby, the following differences appear when examined under a lens.

The animals from Tenby (like those from Exeter with which I am acquainted) are a dark but brilliant cobalt blue, while those from Murlough are more of an indigo colour. This alone might be put aside as trivial, but the mantle of the Irish specimens is always speckled with dark brown like those of the normal *cellaria*, whereas the mantles of the specimens from Tenby are entirely without these dark specks.

I also remarked that the Irish specimens lost most of their dark colour when boiled, which was not the case with those from Tenby.

Not satisfied with all this I sent some of the Irish specimens to Mr. W. Moss of Ashton-under-Lyne, who has had great experience in photographing the radulæ and genitalia of numerous species, and especially of the *Hyaliniæ*. His opinion is that both radulæ and genitalia of the Lancashire, Manx, and N. Irish specimens are nearer to those of *cellaria* than to those of the *Draparnaudi* from Tenby.

(It may be remarked here that it is not quite certain if our typical *Draparnaudi* from Tenby are identical with what the continental authorities call by that name; indeed there is a doubt whether the continental authorities are unanimous).

The size of the doubtful forms under discussion is remarkable. Some Lancashire specimens that Mr. Moss sent me for inspection measure from 12 to 13 mm. in diameter, while I collected some from Murlough measuring 12, 13, and one 14 mm. The breadth of a large typical *cellaria* is 10 mm., and that of *Draparnaudi* 14 mm.

Taking all these facts into consideration, I am unable to consider the Irish specimens as *Draparnaudi*, but am inclined to think them a form of *cellaria*, though, of course, I do not pretend to say that the real *Draparnaudi* does not exist in the North of Ireland.

Northampton.

PROCEEDINGS OF IRISH SOCIETIES.

ROYAL ZOOLOGICAL SOCIETY.

Recent gifts include four Pekin Bantams from Mr. J. B. O'Callaghan, three pheasants from Mr. R. D. Dove, a pair of Angora Rabbits from Captain A. F. Boxer, a Guinea-pig from Mr. E. J. Rabbit. A Barbary Ape, a Pigtail Monkey, a Grisct Monkey, and two Capuchin Monkeys have been bought.

5,250 persons visited the Gardens during January.

BELFAST NATURALISTS' FIELD CLUB.

JANUARY 13.—W. J. FENNEL, M.R.I.A., in the chair.

H. HANNA, M.A., B.Sc., dealt with the fauna of the Antrim Coast, describing the results of researches made by him and Mr. Lyster Jameson in the early part of September of last year. Particular attention was devoted to the Turbellarian worms and other low forms of marine invertebrates found in the Laminarian zone.

Further on reference was made to a species of Polychæte, which has been submitted to eminent authorities in England, who announce it as new to the British fauna. This paper will appear in our pages in a future number.

Miss ANDREWS read a paper on "Fairies and their Dwelling-places," in which was given an excellent resumé of the information currently received on the subject. Many original illustrations and stories collected by the writer in different parts of Ireland were given to show the customs, habits, and peculiarities of the "good people."

R. WELCH read a paper on "Shell Pockets on Sand-dunes, ancient and modern," illustrated with photographs and specimens. The reader described the curious little "pockets" of small shells which one may find collected together by the swirling action of the wind round the dunes. Many of the small shells so collected are rare and local. The paper is published in our present number (pp. 77-82).

BOTANICAL SECTION. JANUARY 15.—The monthly meeting of the Section was held, when the *Labiata* and allied groups were considered. The parasitical habits of some of them were described and recommended as a subject which requires further observation.

GEOLOGICAL SECTION. JANUARY 27.—A paper was read by Miss S. M. THOMPSON on "Recent Work in Glacial Geology."

The paper dealt with the observations made by the writer and other members of the Club on local sections of deposits of the Ice Age.

A map was exhibited showing the distribution of some distant rocks, selecting the Clyde area, Cantyre, the district of Cushendall and Cushendun, and an extensive list of erratics found in the sections further showed the great amount of work done towards elucidating the subject.

The views of the two Schools—"submergence" and "land ice"—were clearly explained. The writer stated the belief "that such beds as the deposit at Woodburn, where Mr. Stewart found the valves of the delicate *Leda pygmaea* intact and still in juxtaposition, were laid down under-

neath the sea, but that there is so much in the theory of land ice that meets many of our difficulties that its great probabilities must be admitted, especially since the Spitzbergen Expedition of 1896—on which glaciers were found with portions of sea beaches involved in them.”

DUBLIN NATURALISTS' FIELD CLUB.

JANUARY 11.—The Annual General Meeting was held in the Royal Irish Academy House. PROF. COLE, F.G.S. (President), in the chair. The President read a copy of a telegram which had been sent on behalf of the Club to the President of the Belfast Naturalists' Field Club, on Mr. J. Wright's obtaining a grant from the Civil List Fund, as a mark of appreciation of his investigations in Irish Foraminifera, as follows:—“President, Field Club, Museum, College Square, Belfast. Dublin Club congratulates Joseph Wright and Belfast fellow-members. Cole, President; Praeger, Vice-President; Johnson, Secretary.”

The Report and Statement of Accounts for the year 1897 were read. The Report gives a list of the five evening meetings and six excursions held during the year, which have been fully reported in the *Irish Naturalist*. Attention is directed to the projected visit of the British Mycological Society to Dublin in September next, for investigation of the Fungi of Leinster. A complete list of Irish Fungi, in anticipation of this visit will, it is promised, be compiled by Mr. G. Pim and Dr. M'Weeney. The membership of the Club now stands at 174, a decrease of 26 from last year, a large number having been struck off for non-payment of subscription. More stringent rules regarding subscriptions have been introduced, which will, it is hoped, lead to prompt payment in future. The expenditure for the year amounted to £44 13s. 5d.; a profit of £1 os. 4d. was made on the excursions and a balance of £43 8s. 4d. remains in the treasurer's hands. A grant of £10 to the *Irish Naturalist* was recommended.

The adoption of the report was moved by Professor HADDON, D.Sc., and seconded by Miss O'HARA, subject to several verbal alterations and the increase of the grant to the *Irish Naturalist* for 1897 from £10 to £15, and the reference of a further grant of £5 to the incoming Committee.

The Officers and Committee for 1898 were declared elected as follows:—President, R. L. Praeger, B.A., B.E.; Vice-President, J. E. Palmer; Hon. Secretary, Professor T. Johnson, D.Sc., F.L.S.; Hon. Treasurer, H. K. Gore Cuthbert; Committee, F. W. Burbridge, F.L.S.; G. H. Carpenter, B.Sc.; Professor G. A. J. Cole, F.G.S.; G. P. Farran; Miss R. Hensman; C. H. Hurst, Ph.D.; A. V. Jennings, F.L.S., F.G.S.; Miss R. Mahaffy; Greenwood Pim, M.A.; H. J. Seymour, B.A.; Miss Singleton; Mrs. Tatlow.

The Presidential chair was then taken by Mr. R. L. PRAEGER, B.A., B.E., who proposed, and Mr. SEYMOUR seconded, a vote of thanks to Professor Cole for his valuable help to the work of the Club during his two years' Presidency. This was adopted. The thanks of the Club were on the proposal of Dr. ALCOCK, seconded by Mr. B. T. PATTERSON, C.E., given to the Council of the Royal Irish Academy, for permission to hold the

winter meetings of the Club in its House, as usual, and, on the motion of Mr. MITCHELL, seconded by Miss SINGLETON, to the Dublin Press for regularly reporting the Club's proceedings.

Professor COLE, F.G.S., showed a series of lantern slides illustrating some features of geological interest in Co. Kerry.

The Rev. Maxwell CLOSE, M.A., F.G.S., moved, and the Rev. W. S. GREEN, M.A., F.R.G.S., seconded the following resolution:—"That the Dublin Naturalists' Field Club presses upon the Boards of Primary and Intermediate Education in Ireland the importance to education and to the country of introducing Natural Science as a subject to be encouraged in Irish schools."

Mr. CLOSE, in moving this resolution, said that most people were, as Wordsworth had it, "moving about in worlds unrealised." They might be called anthropocentric Philistines. Natural Science, introduced into the school curriculum would, as the resolution stated, be distinctly beneficial both to student and country. In seconding the resolution, Mr. GREEN said that unless the students were brought into direct contact with nature and natural objects, the introduction of the subject into schools would be more or less useless. As things were at present he was afraid not much could be done. The teachers in the schools must first be trained to give the kind of instruction in Natural Science necessary. Dr. C. H. HURST said that if Natural Science were taught as a literary subject it would be better to exclude it altogether from schools. Mr. F. W. BURBIDGE, M.A., F.L.S., said visits of scholars to the fields, the public gardens, and to museums were necessary. He was astonished, when in Borneo, at the knowledge of the plants and animals the natives, old and young, possessed. The idea that a knowledge of Natural Science was inimical to religion was now almost dead.

Colonel PLUNKETT said he heartily supported the resolution on the understanding that the subject would be taught practically, and not as mere book knowledge. Dr. T. JOHNSON said students of science held that Natural Science was as effective an instrument of education as many subjects at present in the school curriculum, in training powers of observation, deduction, expression, etc., that it was also utilitarian, and also helped one towards a fuller realisation of the world. Mr. PRÆGER in putting the resolution, mentioned a collection of plants he had recently seen made by a young American scholar, as an illustration of one of the objects to be aimed at. The resolution was adopted. The following were elected members:—J. G. M'Nab, W. R. M'Nab, A. G. Ryder, C.E., and one candidate for election was nominated.

The alterations in the rules, of which due notice had been given, were proposed by the Secretary, seconded by the Treasurer, and adopted.

FEBRUARY 8.—The President (R. LL. PRÆGER, B.A.), in the chair. Seventy-three members and their friends were present. Dr. N. H. ALCOCK read a paper on the structure and habits of bats. Commencing with a short account of the zoological affinities of the group, the general anatomy of the bats was next described. The departure of the skeleton

from the common mammalian type was noticed, especially in the great development of the upper limbs and shoulder girdle, and in the backward direction of the knee joint. The internal organs were shown to correspond with the classification of the bats into the two groups (of Megachiroptera and Microchiroptera), and to be related to the customary food of these animals, the large bats living on fruit, the smaller chiefly on insects. A very small minority of the small bats, including the vampire bats, live by sucking the blood of animals. Some observations on the normal character and general habits of the Chiroptera concluded the paper, which was fully illustrated by specimens, diagrams, and lantern. The President, Mr. Jennings, F.L.S., and Mr. Burbidge, F.L.S., spoke on the paper. Mr. Burbidge mentioned points of interest he had noticed in Borneo bats.

The following exhibits were shown :—An American girl's collection of plants, by R. LL. PRAEGER, B.E., President; *Cordyceps militaris* from Howth, by A. V. JENNINGS; a collection of Australian plants by Mrs. LONG; *Cyathus striatus* from Co. Wicklow, by B. T. PATTERSON, C.E.; Mora seeds from British Guiana by Dr. T. JOHNSON, Hon. Sec.

Mr. Leech was elected, and three candidates for election were nominated. The provisional list of excursions for 1898 was read out, and attention called to the report on the collection of photographs of geological interest in the United Kingdom, being got together by a Committee of the British Association for the Advancement of Science.

NOTES.

ZOOLOGY.

International Zoological Congress,

We have received circulars regarding the fourth meeting of this Congress, which is to take place at Cambridge on August 23rd, the first international gathering of Zoologists in the British Islands. Sir Wm. Flower, F.R.S., had been chosen as President, but through ill-health he was unfortunately compelled to resign the honour, and Sir John Lubbock has been elected in his place. Among the Vice-Presidents of the General Committee we notice the names of Professors R. J. Anderson, D. J. Cunningham, R. O. Cunningham, M. Hartog, and E. P. Wright, Dr. R. F. Scharff, and Mr. R. M. Barrington. It is to be hoped that Irish zoologists generally will support the Congress, if possible, by attending its deliberations, but at least by subscribing to its funds. The entertainment of distinguished foreigners, which in so many continental countries is gladly undertaken by the State, is, among ourselves, left to private enterprise. May the scientific men of Great Britain and Ireland unite to welcome the distinguished guests who may be expected to attend the Cambridge meeting. Dr. Scharff, of the Dublin Museum, has

been asked both by the London Secretary of the Congress (Prof. F. J. Bell), and by the Royal Zoological Society of Ireland to work up interest in the matter in this country, and he will be glad to furnish any information on the subject.

BIRDS.

Ornithological Notes from Kilkenny.

Mr. John O'Connell, junior, of Kilkenny, has been good enough to send me a specimen each of the Water Rail (*Rallus aquaticus*); the Grey Phalarope (*Phalaropus fulicarius*), a brown variety of the Rook (*Corvus frugilegus*), and a Rook in which the mandibles are deformed, the upper crossing the lower. The Phalarope was shot by Mr. O'Connell near Kilkenny in October, 1897, and the brown Rook was received by him in April of the same year.

He also informs me that six or seven years ago he shot a Crossbill (*Loxia curvirostra*) in Kilkenny, and observed a small flock in a Larch wood. He has not heard of any more being in the neighbourhood since that date.

G. E. H. BARRETT-HAMILTON.

Kilmanock, New Ross, Co. Wexford.

Young Redbreasts in February.

It may be of interest to record that in a garden here six young Robins (*Erithacus rubecula*) have been hatched, and are now (February 7) fully fledged. Most readers of the *Irish Naturalist* will doubtless have heard of the arrival of the Cuckoo.

T. B. GIBSON.

Ferns, Co. Wexford.

MAMMALS.

Seals In the River Lee at Cork.

A correspondent sends us a cutting from a Cork newspaper, recording the occurrence of Seals observed swimming in the Lee, off the Marina in that city, on the 10th January. One specimen about three feet long was captured alive. The presence of these animals up a river ten miles from the sea is noteworthy.

BOTANY.

PHANEROGAMS.

Flora of Co. Wexford,

To the *Journal of Botany* for February Rev. E. S. Marshall contributes a valuable paper on the results of ten days' botanizing in Co. Wexford in June, 1897. *Callitriche truncata* is definitely added to the Irish flora, and a more attractive addition is furnished by *Leucojum aestivum*, which Mr. Marshall considers truly native. Further information in favour of the view that *Sisyrinchium californicum* is native in the Slaney marshes is given, and new stations for a number of rare plants are listed.

NATURALISTS AT MOTE PARK.

BY R. LLOYD PRÄGER, B.A.

AS THE result of a kind invitation from Lord Crofton, a little party of naturalists, consisting of Prof. T. Johnson, Mr. R. J. Mitchell, Mr. J. N. Halbert, and myself left Dublin on May 30th last, to spend a week in investigating the flora and fauna of Mote Park near Roscommon, and its neighbourhood. We were met at Ballymurray station by Hon. R. E. Dillon, who acted as guide during our stay, and on arrival at Mote Park we found Mr. W. F. de V. Kane. With the assistance of bicycles and of the vehicles which Lord Crofton placed at our disposal, we were able to cover a good deal of ground, and to get a fair idea of the surrounding district and its biological possibilities, from the River Suck to Lough Ree, and for some miles northward and southward of Mote Park. County Roscommon is *par excellence* a grazing country. Marshes have been drained, stream-courses deepened and straightened, and the greater part of the surface is occupied by large pasture fields, unsuitable for the operations of the naturalist. The woods of Mote Park, containing much decaying timber, supplied good hunting-ground for the entomologist and cryptogamic botanist, but the student of flowering plants soon found that the rabbits had taken what the cattle had spared; the phanerogamic flora proved decidedly limited. Hills or rocks there were none. The extensive bogs, and adjoining marshy meadows, yielded a good harvest, and a day spent on Lough Ree, and another along the banks of the Suck at Mount Talbot, by kind invitation of Mr. W. J. Talbot, D.L., yielded a number of species that we did not meet with elsewhere.

A short afternoon spent further up the Suck, at Dunamon Castle, on the Galway bank, made us wish to do further collecting on the rough boggy and swampy ground by the river side. On the whole, the entomologists of the party (Messrs. Kane, Dillon, and Halbert) secured excellent results, as will be seen by the papers which follow. Prof. Johnson and Mr. Mitchell devoted themselves to the collection of fungi, particulars of which will, no doubt, be published in due course.

To Lord Crofton and the Misses Crofton our warmest thanks are due for their great kindness, and continual helpfulness in our researches.

BEETLES COLLECTED AT MOTE PARK, MOUNT TALBOT, AND CLONBROCK.

BY J. N. HALBERT.

THE excursion to Mote Park, Co. Roscommon, last June, was productive of very satisfactory results to those of our party who devoted their time to the insect fauna. As might be expected, the bulk of our captures was similar to what we had already noted at Clonbrock in the previous year, seeing that both localities afford practically the same kind of collecting ground. At Mote Park, however, we had an opportunity of working in a new county that had not been previously visited by any coleopterist. Hence, our efforts were rewarded by the capture of a fair number of novelties, and a delightful day spent on Lough Ree and its islands helped to swell our list. For many of the rarer species we have to thank the Hon. R. E. Dillon, who had been collecting in the neighbourhood for some days previous to our visit.

The most interesting of Mr. Dillon's captures is undoubtedly *Lytta vesicatoria*, the well-known "Spanish Fly," of which he found a single specimen on Mountain-Ash in Cloonca Wood. This handsome insect was previously unknown as an Irish species, and is of such extremely local occurrence in southern England, that it was considered not to be indigenous by one of our most experienced coleopterists, the late Mr. E. C. Rye. But the insect is very widely distributed in Europe, and there seems to be no good reason why it should not occur native in Britain. The wood where this important capture was made is close to Mount Talbot, Co. Roscommon, and is said to be a remnant of what was formerly a forest of considerable extent. The Longicornia are but poorly represented in our Irish list, but the capture, by Mr. Dillon, of such rare species as *Aromia moschata* (Musk-beetle), *Hylotrupes bajulus*, *Rhagium indagator*, *Leptura scutellata* and *L. fulva* clearly proves that this wood-frequenting family only requires looking for in suitable localities, and at the proper time of the year. It is to be hoped that Mr. Dillon will be able to continue his researches, as there are yet many genera amongst the "longicorns" that we should expect to find represented in the old woods of our western counties.

In the following list, which includes only the less common species, there are no fewer than eighteen beetles not previously recorded from this country, though a few have already existed in collections. Where no special locality is mentioned, Mote Park is intended; and I have to thank Dr. David Sharp and Mr. G. C. Champion for kindly verifying some of the critical species. The species now recorded for the first time as Irish are indicated by an asterisk :—

Cicindela campestris, L.—Frequent.

Carabus arvensis, F.—Taken once on a heath near Mote Park.

Pelophila borealis, Payk.—Swept off rushes on a small islet in Lough Ree. This interesting "ground-beetle" may be said to be characteristic of our western lakes. It frequently occurs on the islands.

Blethisa multipunctata, L.—Lough Ree, also at Clonbrock.

Badister sodalis, Duft.—Banks of the Suck near Mount Talbot. Has occurred near Belfast (Haliday), and Galway (J. J. Walker).

Anisodactylus binotatus, F.—One specimen, referable to the variety *spuraticornis*, Deg., in the same locality as the preceding.

Amara ovata, F.

A. lunicollis, Schiod. } Frequent; also at Clonbrock.

Anchomenus viduus, Panz. (var. *maestus*, Duft.)—Lough Ree.

In my experience the variety is the more common form in Ireland.

Stomis pumicatus, Panz.—Common.

Bembidium æneum, Germ.—Banks of the Suck, Mount Talbot.

B. obtusum, Sturm.

B. doris, Panz.

B. bipunctatum, L.

} Lough Ree.

Dromius quadrinotatus, Panz.—Beaten off Poplar.

Haliplus obliquus, Er.

H. fluvialis, Aubé.

} River Suck, common.

Cœlambus v-lineatus, Zett.—Occurred in almost every piece of water; seems to be a very common species in the west.

Deronectes assimilis, Payk.

D. depressus, F.

} Abundant in the River Suck at Mount Talbot.

Hydroporus lineatus, F.—In drains.

Agabus paludosus, F.

A. nebulosus, Forst.

A. chalconotus, Panz.

} Common. Lough Ree, &c.

***A. femoralis**, Payk.—River Suck near Mount Talbot, widely distributed though local in Britain.

Rhantus exoletus, Forst.—Lough Ree.

Cyrrinus minutus, F.—Frequent, especially in bog-pools on heaths.

G. bicolor, Payk.—Lough Ree. Specimens of *G. elongatus*, Aubé, have been frequently recorded as this species in error, but there seems to be no doubt about the Lough Ree insect. I am indebted to Mr. G. C. Champion for verifying this identification.

Phlydrus testaceus, F.—Lough Ree.

***Berosus luridus**, L.—Frequent in drains and pools on bog land.

Hydræna angustata, Sturm.—Lough Ree. Has occurred at Armagh and near Waterford; range in Britain, northern.

Aleochara brevipennis, Grav.—Frequent.

***Microglossa pulla**, Gyll.—One specimen by sweeping. Verified by Mr. Champion.

Ilyobates nigrlicollis, Payk.—Banks of the Suck.

Callicerus obscurus, Grav.—Sweeping in grassy places.

Homalota londinensis, Sharp. (*Gyllenhali*, Thoms.)—River bank at Mote Park; verified by Dr. Sharp. Has occurred in the neighbourhood of Armagh.

Falagria sulcata, Payk.—Mote Park.

***Tachyporus pallidus**, Sharp.—Sweeping herbage. I found one example amongst a number of common *Tachypori*; does not appear to have been previously recorded from Ireland.

Megacronus cingulatus, Mann.—Under stones on river banks, local in Ireland. *M. analis*, F., has occurred near Clonbrock.

***Quedlus longicornis**, Kr.—One specimen taken by Mr. Dillon on the bank of the Suck at Mount Talbot. Verified by Mr. Champion. Very local in England, where it has occurred in the north midland counties and also in the S.W. of Scotland.

Leistotrophus nebulosus, F. }
Lathrobium quadratum, Payk. } Banks of the Suck.

***Pæderus littoralis**, Grav.—This pretty species occurred on the bank of a stream at Mote Park. It is widely distributed in the South of England.

Oxytelus inustus, Grav.—Sweeping herbage.

Omalium lopterum, Steph. }
O. punctipenne, Thoms. } Under bark.

Silpha dispar, Herbst.—Shore of Lough Ree, under stones.

Choleva Watsoni, Spence.—Frequent; the closely allied species, *C. fumata*, Spence, occurs at Clonbrock, though we failed to find it at Mote Park.

Hister neglectus, Germ.—A few in dead animals in company with swarms of *H. carbonarius* and *Saprinus nitidulus*.

Hippodamia xill.-punctata, L.—One specimen occurred by sweeping herbage on river-bank at Mote Park, seems to be a rather scarce insect. Mr. Dillon has taken it at Clonbrock.

Mysia oblongoguttata, L.—Not common, also at Clonbrock.

Coccinella hieroglyphica, L.—Frequent on heaths.

Halyzia xvi.-guttata, L.—Common.

H. conglobata, L. }
Chilocorus bipustulatus, Ill. } Frequently off willows.

Scymnus Redtenbacheri, Muls.—Sweeping on heaths.

Cercus bipustulatus, Payk.—Common on Meadowsweet.

Epurea deleta, Er. }
Rhizophagus dispar, Gyll. } In fungi.

- Cychramus luteus**, F. (var. *fungicola*, Heer.)—Clonbrock. This variety does not appear to have been previously recorded, though it has been taken at Rostrevor by Dr. Scharff, and by myself at Woodenbridge. It is given specific rank in Fowler's "British Coleoptera."
- Telmatophilus caricis**, Ol.—By sweeping in marshy places.
- Sinodendron cylindricum**, L.—This conspicuous insect infests some old Oaks at Mote Park, and I also found it on willow.
- Prilobum castaneum**, F.—Another wood-boring species, occurs in great numbers in the same Oaks.
- Melolontha vulgaris**, F. (Cockchafer).—Evidently common; it simply swarmed about the Oaks at dusk.
- ***Sericosomus brunneus**, L.—Swept off Birch. Not recorded as an Irish species, though there is a specimen in the Museum collection taken at Coolmore, Co. Donegal, by the Rev. W. F. Johnson.
- Corymbites tessellatus**, F.—Frequent on heaths.
- ***Campylus linearis**, L.—Taken by sweeping near willows at Mount Talbot. I found the remains of this species in decayed fir stumps in Cratloe Wood, Co. Clare.
- ***Cis alni**, Gyll.—Taken in a *Boletus*, verified by Mr. Champion.
- C. nitidus**, Herbst.—Common in fungi.
- Aromia moschata**, L. (Musk-beetle).—Taken on a decaying willow in a field near the Sheep-pool Bog at Clonbrock. This record helps to fill up the gap in the Irish range of this fine insect, as it has only been taken in the Killarney and Glengarriff districts and near Belfast. It should be searched for about old willows in early summer.
- ***Hylotrupes bajulus**, L.—Cloonca Wood, one specimen. Local in the South of England, where it is usually found in pine and fir stumps.
- Rhaglum inquisitor**, F.—Cloonca Wood. Mr. W. F. de V. Kane has met with this species in many localities in the west. But it does not seem to have been observed so far in the province of Leinster.
- R. indagator**, Gyll.—Clonbrock. This is the second occurrence of this rare longicorn in Ireland. Mr. R. Standen took a specimen on the coast of Meath, near Laytown (*Irish Naturalist*, 1894, p. 181), but this specimen had in all probability emerged from some split logs that were lying in the vicinity, and which may have been imported. But there is no doubt that the species finds a suitable habitat in the woods of Co. Galway. Locally common in many Scotch localities, but extremely rare in England.
- ***Pachyta collaris**, L.—Cloonca Wood.
- ***Leptura scutellata**, F.—Clonbrock, one specimen on the Sheep-pool Bog. Rare in the South of England, where it seems to occur in some numbers in the New Forest.
- ***L. fulva**, De G.—Clonbrock.
- ***L. livida**, F.—Mote Park, on flowers in woods. Both this and the preceding species are somewhat widely distributed in the South of England, but they have not been recorded from north of the midlands.

Grammoptera ruficornis, F.—The var. *pallipes*, Steph., occurred on Hawthorn, the type is abundant.

G. tabacicolor, De G.—Taken with the preceding, but much rarer.

Lelopus nebulosus, L.—Mote Park, on Oaks.

Donacia impressa, Payk.—Frequent, especially on bogland, also at Lough Ree.

D. discolor, Panz.—Abundant on heaths.

***D. clavipes**, F.—I took a single specimen of this species by sweeping aquatic plants on an islet in Lough Ree.

Lochmæa cratægi, Forst.—Mote Park, on Hawthorn.

***Galerucella vlburni**, Payk.—Taken by Mr. G. H. Carpenter on the Guelder Rose at Clonbrock, and subsequently in numbers by Mr. Dillon. We now have the six British species of this genus recorded from Ireland.

G. sagittariæ, Gyll.—Frequently, by sweeping rushes on river-bank, occurs at Clonbrock.

Longitarsus holsaticus, L. } Common.
L. pellucidus, Foudr. }

Haltica oleracea, L. (var. *lugubris*, Weise).—Mote Park. Both the type and the variety have occurred at Clonbrock.

***H. palustris**, Weise.—I found several examples of a rather large dark blue *Haltica* by sweeping herbage on the sides of drains at Mote Park and Mount Talbot. Specimens sent to Herr E. Reitter were referred to this species.

Psylliodes plicina, Marsh.—Common.

Rhinosimus viridipennis, Steph.—Rarely under bark, also at Mount Talbot. I have taken it near Dublin, in moss on old tree stumps.

***Lytta vesicatoria**, L. (Spanish Fly).—A single specimen taken by Mr. R. E. Dillon on Mountain-Ash, in Cloonca Wood, Co. Roscommon. Extremely local in the south of England, where it has occurred at Colchester, Cambridge, Hampshire, and a few other places. (Fowler, *Brit. Col.*, vol. v.)

Apion Gyllenhall, Kirby.—Common.

Brachysomus echinatus, Borsd.—Mote Park, sweeping herbage in woods.

Polydrusus tereticollis, De G. } Abundant on young Ash and
P. cervinus, L. } other trees.

Phyllobius calcaratus, F.—Frequent on willows.

P. pyri, L.—Occurred commonly on Sweet Gale, and willows in boggy places.

Alophus triguttatus, F.—Not common.

Orchestes ilicis, F.—On Oaks.

O. rusci, Herbst.—Abundant on willows.

Hylobius abletis, L.—A few specimens of this, the destructive "pine weevil" were taken at Mote Park.

Eriirrhinus æthiops, F.—Not uncommon in boggy places, but evidently local. Rare in England, where it occurs in Yorkshire and also in the south of Scotland.

Bagous allsmatis, Marsh.—Sweeping water-plants.

Elleschus bipunctatus, L.—Clonbrock.

Gymnetron labilis, Herbst.—Mote Park.

Clonus hortulanus, Marsh.—Several on *Scrophularia*.

Eubrychius velatus, Beck.—Mount Talbot, in drains.

Trypodendron domesticum, L.—Cloonca Wood. Taken by beating Ash trees.

SPIDERS COLLECTED AT MOTE PARK, MOUNT TALBOT, AND CLONBROCK.

BY GEORGE H. CARPENTER, B.SC.

DURING his expeditions around Mote Park in search of beetles, my friend Mr. Halbert was good enough to secure what spiders came in his way, and the examination of his small collection has brought to light several additions to the Irish list, and has also extended our knowledge of the range of several local species. Among the six-eyed spiders of the family *Dysderidæ*, *Harpactes Hombergii*, Scop., was secured, together with the tiny *Oonops pulcher*, Templ., belonging to the nearly allied family *Oonopidæ*. In my remarks on the spiders collected at Clonbrock in June, 1896, I noticed¹ the absence of *Dysderidæ*. But during a few pleasant days in September of last year, when I myself had the opportunity of exploring the Clonbrock neighbourhood under the kind guidance of Mr. Dillon, I noticed our common dysderid, *Segestria senoculata*, L., to be abundant under the bark of trees.

Among the more interesting spiders taken at Mote Park were *Dictyna uncinata*, Thor., and *D. latens*, Bl., both of which had occurred the previous June at Clonbrock, while at Mount Talbot *D. arundinacea*, L., was found. At the latter locality a male of *Tmeticus Huthwaitii*, Cb., was secured; this species is local and scarce in Great Britain, but appears to have a wide range in Ireland. At Mote Park a male of *Troxochrus hiemalis*, Bl., occurred, a tiny spider belonging to the *Erigoninæ*, which has not yet been recorded as Irish, though I have received specimens from Co. Armagh as well as from Co. Dublin. As the spider is now known to be adult in summer as well as in winter, the specific name is hardly appropriate. Among the orb-weavers *Epeira gibbosa*, Wlck. (*bicornis*,

¹ *Irish Nat.* vol. v., p. 225.

Bl.), was taken at Mote Park for the first time in Ireland. Though an immature female, the specimen shows the characteristic form and markings of the abdomen. Immature specimens of the great wolf-spider, *Dolomedes fimbriatus*, Cl., occurred both at Mote Park and at Mount Talbot; it seems likely that this spider ranges all over Connaught. In the same family (*Lycosidæ*) a very interesting addition to the Irish list is afforded by *Pirata hygrophilus*, Thor., of which a male was secured at Mote Park. I find a female of the same species among Mr. Halbert's captures at Limerick in June, 1895. *P. piraticus*, Cl., which is spread commonly over most of Ireland, was taken at Mount Talbot.

Of my own collection made at Clonbrock in September, the most interesting spider was *Pachygnatha Listeri*, Sund. Adults of both sexes were numerous in the wood. I believe this to be its first genuine record as an Irish species, for though in Mr. Workman's list¹ it is inserted "on authority of Blackwall," I can find no mention of an Irish habitat in Blackwall's monograph. Both *P. Clerckii*, Sund., and *P. Degeerii*, Sund., are given by him as Irish; and they are indeed widely distributed over the country, the latter being one of our commonest species. Now, however, we know that all three British spiders of the genus extend their range into Ireland. A few days after my return from Clonbrock, Mr. Halbert handed me specimens of *P. Listeri* which he had taken in the Parnell demesne at Avondale, Co. Wicklow. Another addition to the Irish list which I secured at Clonbrock was *Leptyphantes flavipes*, Bl., an adult male, a near ally of the common *L. tenuis*, Bl., but evidently very much scarcer. I was also fortunate in securing an adult male of *Ero furcata*, Vill. (*Theridion variegatum*, Bl.). This beautiful species is as yet unrecorded for Ireland, though I have received specimens from Mr. J. N. Milne of Londonderry, while Mr. Halbert has taken the female in Co. Dublin,

¹ *Entomologist*, vol. xiii., 1880, p. 128.

RECENT CONTRIBUTIONS TO THE GEOLOGY OF IRELAND.

I.—Annual Report of the Geological Survey of the United Kingdom for 1896. By SIR ARCHIBALD GEIKIE, F.R.S. London; 1897. Price Sixpence.

Quietly and steadily, with very little recognition, and, unhappily, with no system of bringing its publications before the general eye, the Geological Survey goes on its way, unravelling the details of the structure of Ireland, and effecting the most surprising changes in our knowledge of the country. With a reduced staff, and with what is regarded as only a temporary grant, this great scientific duty is carried on; and it can be said that such work is completed only when our knowledge of the earth itself becomes complete. Already many of the earlier memoirs call for the revision that recent research has shown to be required; and in the future we may hope for the undertaking of a "drift" survey, representing the actual soils above the "solid" geology, on the same system as that already adopted for the whole of England. The simply issued annual reports give one a clear idea of the work accomplished in each year. On pp. 8 to 10 of the present one, we have a summary of the areas covered by the four Irish surveyors, and the record of 900 specimens of Ordovician and Silurian fossils added to the public collections by the labours of Mr. Clark. On p. 48, we find the important statement that the Ordovician (Lower Silurian) rocks are now proved to occupy only a small north-western belt, and the tops of a few articlines, in the wide area from the north of Co. Down to Dublin, True Silurian (Upper Silurian) rocks thus receive an enormous extension on our maps, the series represented being mainly Llandovery; while the epoch of the "Caledonian" folding in Ireland, with its accompanying intrusions of granite, becomes placed decisively as post-Silurian, not merely as post-Ordovician.

The difficult mapping of Co. Mayo is providing at present more problems than can be dealt with. The eruptions south of Lough Mask (p. 49) are now transferred from Llandovery to Bala times, and are thus contemporary with those of Snowdon. Mweelrea itself (p. 50) is shown to contain both Ordovician and Silurian strata; while the startling statement of the Wenlock age of the Croagh Patrick quartzites receives still further confirmation. The land against which these varied series were laid down was a highland of the old schists—including, we may presume, the quartzite of the Twelve Bens—which lay to the south of Killary Harbour. The work of 1897 and 1898 will no doubt give greater precision to the Ordovician boundaries sketched out in the present report. In any case, the Ordovician strata in Mweelrea fully prove the contention of Sir A. Geikie that the Connemara schists are of much earlier age. For them we must still be content to use the term "Dalradian."

II.—**The Cretaceous Strata of County Antrim.** By DR. W. FRASER HUME, F.G.S. (*Quarterly Journ. Geol. Soc. London*, vol. liii., 1897, pp. 540-606).

Prof. Tate in 1865, and Prof. Barrois, of Lille, eleven years later, investigated in detail the Cretaceous series of the north of Ireland. Since that time, we have learnt a great deal respecting the zones of the Chalk; and now Dr. Hume, after his elaborate microscopic and quantitative studies of the English strata, has given us a similarly careful account of his researches on their Irish relatives.

The author divides the Cretaceous area of the County of Antrim into five parts. In the "southern" division, only the highest strata were deposited, against the Triassic clays, as the Chalk sea gradually deepened and extended. The series mapped as "Upper Greensand" in this district is shown to be a shore-bed of far later date—in fact, of Senonian age.

In the "central" and "eastern" divisions, the latter including Islandmagee, a fairly complete series exists, from the Upper Greensand zones to that of *Belemnitella mucronata*. In the central area, the beds were nearer a shore-line than in the eastern; in the latter, Turonian strata, lost elsewhere by an unconformity, were fortunately laid down and preserved.

In the fourth or "peninsular" area, we have the strata that were deposited against the peninsula or island of ancient rocks stretching from the highlands of Londonderry to Cushendun and Torr Head. Here again, we find no Cretaceous deposits until this old ridge sank in Upper Senonian times. The zone of *Actinocamax quadratus* is represented by conglomeratic beds, above which we have the White Limestone of Murlough Bay and Slieve Gallion. The interesting conglomerates of Senonian age are superbly seen at Murlough Bay, as is shown in the important photograph furnished to the author by Mr. Welch, which is reproduced in a full-page plate. The reproduction, however, leaves something to be desired, especially when compared with the type of illustration provided for geologists by the Royal Dublin Society or the Royal Irish Academy in this country.

Similar physical conditions naturally prevailed against the southern side of the great peninsula; and signs of them are "suggested in the northern portion of the Eastern Division" (p. 567).

The fifth or "northern" division includes White Park Bay, and may repay further work, especially when the beds are traced back towards Dungiven. On the coast, the White Limestone reaches in this division its maximum thickness of about 112 feet.

Dr. Hume then proceeds with a characteristic investigation of the chemical and mineral nature of successive zones of the Irish Cretaceous series, with a view to determining the conditions under which the beds were laid down. He finally (p. 598) correlates the Irish and English strata as follows:—

The Glauconitic Sands, and overlying Yellow Sandstones, represent the Upper Greensand of England.

The "Chloritic" Sands and Sandstones, the zone of *Exogyra columba*, are shore-representatives of the Lower Chalk (Cenomanian, as now restricted by English writers).

The only admitted Turonian is recognised in the "chloritic" sands of the eastern division, Lower Turonian beds being everywhere absent. Even these "chloritic sands" may, in reality, belong to the lowest Senonian.

The "Chloritic" Chalk, the well-known conglomeratic "mulatto-stones," and the White Limestone, are all Senonian, the White Limestone representing the zone of *Belemnitella mucronata*.

The distribution of faunas through the Cretaceous series is briefly discussed on p. 605, the author insisting on the fact that local conditions may enable a particular group of species to survive in one area, when extinct in another; hence these species may appear in higher zones, under the return of favourable conditions of depth or food-supply, side by side with the newly arisen fauna that is truly characteristic of those zones. The fauna that reappears, in such favourable intervals, from Lower Cenomanian times to the very base of the zone of *Belemnitella mucronata* forms a text on which we shall hope to hear more from this unbiassed and conscientious author. Meanwhile, his more exciting duties on the staff of the Egyptian survey will no doubt lead to a series of papers on the eastern Cretaceous zones, as complete as those that he has given us on the more interrupted western series displayed across the British Isles.

III—(i.) **The Kildare Inlier.** By C. T. GARDINER, F.G.S., and S. H. REYNOLDS, F.G.S. (*Quarterly Journ. Geol. Soc. London*, vol. lii., 1896, pp. 587-605).

(ii.) **An Account of the Portlaine Inlier (Co. Dublin).** By the same authors. With an appendix on the fossils by F. R. COWPER REED, F.G.S. (*Ibid.*, vol. liii., 1897, pp. 520-539).

(iii.) **The Bala Beds and Associated Igneous Rocks of Lambay Island, Co. Dublin.** By the same authors. (*Ibid.*, vol. liv., 1898, pp. 135-148).

These three papers represent the result of investigations in successive summers by two distinguished students of the University of Cambridge. In view of the rapid extension of our knowledge of the Older Palæozoic series, and the persistent rumours as to the absence of contemporaneous volcanic action in the Ordovician of Ireland, these revisions of older survey work prove in the highest degree acceptable.

In the first place, the authors agree fully with the earlier surveyors in finding abundant evidence of true ashes and lava-flows in the Bala series. At Grange Hill (i., p. 599), at Portlaine (ii., p. 525), and, more unexpectedly, at Lambay Island (iii., p. 140, &c.), they have no doubt as to the occurrence of contemporaneous volcanic action. The argument so carefully worked out at Portlaine is one that must have struck most persons who have walked over the district. Signs of crushing are common; but the volcanic conglomerate includes "two bands of limestone and accompanying shale," which could not have escaped destruction if the conglomerate itself were due to earth-movement. At the same

time, the results of brecciation of bedded rocks ("crush-conglomerates") are well recognised among the shales and limestones at the south end of the section. The authors reproduce Mr. H. Preston's fine photographs of the features due to this brecciation, taken during the visit of the Geologists' Association to Dublin in 1893.

The limestone of the Chair of Kildare is shown to be palæontologically identical with that known as the Keisley Limestone in the English Lake District (i., p. 594), a local variety of the Coniston Limestone. The Bala age of these beds is thus unassailed. The remarkable lithological difference of the beds at Dunmurry and Grange Clare Hills, when compared with those of the Chair, leads the authors to suggest that they are truly Silurian. They are, unfortunately, practically devoid of fossil (i., p. 595).

In the second paper, we have a new detailed section and map of the complex little promontory of Portraine, which will assist all future visitors. The real additions to our knowledge are in the lists of fossils collected (ii., pp. 535-539). Mr. Cowper Reed places the compact limestone of Portraine with that of the Chair of Kildare, as of Upper Bala age, and the coral-beds below it as Middle Bala. The authors regard the unfossiliferous "grits and slates," which overlie the compact limestone and stretch southward along the shore, as identical with those near Balbriggan, which are of Birkhill (Llandovery) age (ii., p. 531). Is so, we have true Silurian beds in close proximity to Dublin.

The difficulty of arriving at or leaving Lambay Island in moderately windy weather renders it hardly visited, except by occasional pleasure-steamers in the summer. Prof Sollas established a camp there some years back; and it is to be hoped that the paper of Messrs. Gardiner and Reynolds leaves him still some new points to publish from the observations made by him at that time. The map (iii., pl. ix.), now put before us adds very greatly to our information. The palæontological evidence is scanty; but the slates and limestones of the island seem to correspond with those across the water at Portraine. An interesting conglomerate is shown to be contemporaneous with these, and consists largely of blocks of limestone, worn from the coral-banks of Ordovician days.

The well-known "Lambay porphyry" occupies, after all, only a few small areas in the volcanic mass of the island. On the east, it occurs apparently as a lava-flow (iii., p. 146), while at other points it comes up in dykes or sills. No great neck is found in the island, such as previous writers had predicted; and the centre of eruption for the andesites, both of Lambay and Portraine, may lie out in the Channel to the east.

Dwellers in Dublin, particularly, will feel grateful to Messrs. Gardiner and Reynolds for these careful essays; and further visits from Cambridge workers will be welcomed, in a country where those engaged in geological research are still unhappily too few.

GRENVILLE A. J. COLE.

ALEXANDER GOODMAN MORE.

Life and Letters of Alexander Goodman More, F.R.S.E., F.L.S., M.R.I.A., with selections from his zoological and botanical writings. Edited by C. B. MOFFAT, B.A., with a preface by FRANCES M. MORE. 12 + 642 pages. Dublin, Hodges, Figgis & Co. (Ltd.), 1898.

It had been known for some time back that Miss More had projected a memoir of her brother, the late A. G. More, but the portly and handsome volume that made its appearance early in March came as a surprise to many even of Mr. More's own friends. One's first thought on looking at the bulkiness of the book, was that it had been over-loaded with matter of but trivial or transient interest, such as marred a similar botanical biography which we noticed recently. But this fear is dispelled on an examination of the matter. Indeed, in all its 650 pages, the only portion which, as it appears to us, might have been omitted without prejudice to the interest of the volume is the two sheafs of testimonials, received when More was a candidate for the Chair of Botany in the Royal College of Science for Ireland in 1869, and for the Curatorship of the Natural History Museum in Dublin in 1881. It needs no reprinted testimonials to show in what esteem More was held by the foremost British botanists and zoologists of the day.

The book consists of two parts—the "Life and Letters," edited by C. B. Moffat, B.A., occupying 398 pages, and the "Appendix," consisting of reprints of the more important of Mr. More's scientific papers, and short notes contributed to various Journals. The portrait which appeared in the *Irish Naturalist* for May, 1895, is used as a frontispiece. A short preface is contributed by Miss More, and we fancy we detect her loving hand also in many of the reminiscences of her brother which fill the volume.

We must congratulate Mr. Moffat on the way he has done his work. The letters, of which many are printed, are judiciously selected from the large number available, and the narrative matter with which the letters, and extracts from More's Journals, are strung together, is well written, and in keeping with his subject. The story of More's life is simple enough. The foremost naturalist of Ireland of recent years had not a drop of Irish blood in his veins. On the father's side his extraction was exclusively Scottish, on the mother's purely English; he was born in London, and spent his early years in Switzerland. From childhood he kept a Journal, which, from the very commencement, shows the strong taste for natural history that was the distinguishing feature of his life. He was nearly eleven when his sojourn in Switzerland ended, and he paid a round of visits to his Scottish relations. Here we find an amusing entry of his first introduction to his native Gorse:—"Madame Spottiswood nous mena un jour voir un couvert de renards, qui était couvert de bruyère et d'une plante piquante très commune en Écosse"!

School life at Clifton and Rugby was followed by his entering Cambridge at the age of 20. Here he renewed a friendship, which had a great effect on his after-life. The Shawe-Taylor family, of Castle Taylor, in south Galway, had been the nearest neighbours of the Mores at Renens, and his old play-fellow, Walter Shawe-Taylor, went up to Cambridge at the same time as himself. Hence came naturally an invitation to More to spend the summer in the west of Ireland, and in June, 1850, he visited for the first time the country which was to be his future home, and with which his name will be always associated. Between university work and vacations spent in natural history pursuits with his family in the Isle of Wight, or with his friends in Ireland, time passed quickly, but serious illness compelled him to relinquish his college career, and from that time forward his life was devoted to natural history, the continuity of his studies and explorations being sadly interfered with by continual breakdowns in health. He became more and more interested in Irish botany and zoology, and at length, in 1864, he proposed to Dr. Moore that they should edit and publish a new Irish Flora. The suggestion was discussed and accepted; More settled in Dublin for the furtherance of the work, and two years later *Cybele Hibernica* made its appearance. The remainder of his life is known to all. He had come to Ireland to stay. In 1867 he was appointed "First Assistant Naturalist" in the Royal Dublin Society's Museum, and in 1881, four years after the Museum had been transferred to the Science and Art Department, he succeeded Dr. Carte in the Curatorship, which post he held till failing health compelled him to resign it in 1887. During his twenty years' connection with the Museum, he was ever in the forefront of Irish natural history. The wilds of Galway and Mayo in particular, and the adjoining seas and islands, were visited and explored again and again. As continual illness rendered him less able for these rough expeditions, he gathered round him a band of energetic disciples, who, fired by his stimulating zeal and enthusiasm, undertook, with his assistance, the botanical exploration of many of the less known mountain-ranges, lakes, and river-basins. After his retirement, though now completely broken down in health, his house in Rathmines continued to be the rallying point of Irish naturalists almost till the end. He died, after a short illness, on 22 March, 1895.

Such is the life which Miss More and Mr. Moffat present to us, the numerous letters and extracts from Journals skilfully woven together with unobtrusive editorial narrative. Not a striking or romantic life, but one of interest to every naturalist on account of the incessant scientific enthusiasm and earnest seeking after truth that pervades it, and one that appeals especially to ourselves owing to its intimate connection with Irish natural history. The Irish botanist will read with deep interest the story of the discovery of *Neotinea intacta*, of fruitless searches for *Erica ciliaris*, of wanderings round the great western lakes, and over the islands of Boin and Aran. Equally attractive are the stories of boating expeditions along the wild Atlantic coast, of long days spent in hunting the Great Grey Seal, in dredging, in ornithology. In later years, when confined to his room for long intervals, his energy found vent in voluminous correspondence with those who were carrying

on the work which he himself loved so much. In these letters his critical knowledge of plants and animals, his never-failing friendliness and helpfulness, and above all his incessant stimulating of his correspondents to fresh exertion, are very clearly portrayed. These characteristics appear also in vivid colours in some scraps of conversation which have been preserved. The following monologue, supposed to be addressed to a young botanist at his own table, recall the man to all who knew him:—"Now, I think, you have materials for a nice paper; why not do it at once? . . . Oh, don't hesitate! Here are pens and paper! Now, about *Ranunculus* —; where do you find it? Most interesting; put that down exactly as you have said it. And —? Roadsides! Say 'introduced.' We have to be strictly honest. And — in clover crops? But do you find it every year? More interesting still; write it down 'a colonist.' You are sure — is native? Ah, let us be careful. I think the 'daggar' should be used. And —? Can you remember the exact shape of the stipules? Perhaps it might turn out to be — Better not mention it yet. Don't be in any hurry." In many places in the book, as in the one just quoted, More's personality is vividly reflected.

A review is supposed not to be complete without a little fault-finding; the critic, from his lofty seat, looks down and condescends to instruct the author regarding the work on which the latter has spent months of loving care, and of which the former often knows but little. But in the present instance, even if one had the wish to grumble, one has but small opportunity. Mr. Moffat's work has been executed with much care, and only one or two trivial points occur to us:—Speaking of Toothwort, Loughgall is mentioned as "still the only County Armagh station known." Two additional Armagh localities will be found recorded by Mr. Lett in *Irish Naturalist*, v., 166. Mr. Moffat speaks of *Carex Buxbaumii* as "found nowhere else in the British Isles," but at Lough Neagh. Its occurrence in Scotland (see *Ann. Scot. Nat. Hist.*, Oct., 1895, and *Journ. Bot.*, Feb., 1896) is now well known. But such slight slips have no bearing on the value of the book.

In the latter third of the book, the more important of Mr. More's scientific papers are reprinted. Conspicuous among these are his "Distribution of Birds in Great Britain during the nesting season" (with map and supplement), "Geographical Distribution of Butterflies in Great Britain," "Botany of the Isle of Wight," "Flora of Castle Taylor," and "List of Irish Birds." To the scientific papers is appended the obituary notice of Mr. More, and bibliography of his writings, which appeared in this Journal from the pen of Mr. R. M. Barrington.

Perhaps the most interesting portion of the book, especially just at present, in view of the forthcoming publication of the second edition of *Cybele Hibernica*, is the part which deals with the formation and working out of the project which resulted in the appearance of the standard Flora of Ireland in 1866—an event of vast importance in the history of Irish botany. Some years ago (if a brief digression from the book before us may be permitted) I picked up in London a copy of *Cybele Hibernica*, which had belonged to John T. Syme, *alias* J. Boswell Syme, *alias* Dr.

Boswell. Among several interesting letters and notes on Irish botany which it contains, are two from Dr. David Moore and one from A. G. More, addressed to Syme in 1865-66, and dealing with *Cybele*, and with rare or critical Irish plants. Another letter, from More to Mrs. Syme, is so characteristic that, perhaps, I may be pardoned for reproducing portion of it:—

3, Botanic-view, Glasnevin, Dublin,

February 18, .

"DEAR MRS. SYME,—May I drive a bargain with you? I am anxious to possess a likeness (*carte*) of your respected husband, and as I cannot hope to steal it, I must (for once only) try the "honest" course of barter. Wherefore, I have enclosed you a caricature of a big-headed man, which may serve for phrenological purposes, and I shall feel greatly richer by the exchange, if you will let me have Mr. Symes' *carte* and signature, for my gallery of British Botanists We have made good progress with our "*quasi-Cybele*," which fortunately was announced under the appropriate title of an IRISH supplement to Mr. Watson's valued work. Is it not singular that everything in this country turns into a "Bull"? And what is very serious to contemplate is that that wonderful turn of expression will surely be set down to A. G. M. As a means possibly of *conciliating* the Irish the plan is worth considering, but it will be *difficult* to make the preface to our book keep pace with the circular

We have laid the foundations all afresh on personal authority, verifying the doubtful or critical species by specimens. And we have reserved the book authorities to be incorporated afterwards, to be used only to fill in blanks. Thus, I trust our book will be something better than a mere compilation, but the labour, especially of criticism, has been immense. Starting with the axiom that nothing is to be accepted unless it is reprov'd, we have catechized and cross-questioned in every direction, hitherto very successfully. By the way, I suppose the "fun" of writing *Cybeles* consists chiefly in the pleasure of cross-examining witnesses, and then acting as judge also. I often think what a good training it would be for a barrister, or what a good "*Cybelist*" a good barrister would make. What a pity that their fine intellect should be wasted at the bar, is it not?

With kind regards to your circle, and especially to Mr. Syme,

I remain, dear Mrs. Syme,

Yours very sincerely,

ALEX. G. MORE.

P.S.—I have been ordered *medically* to abstain from poetry, or you should have had another copy of verses.

P.P.S.—This is a bad land for thieves, there is nothing worth stealing, unless in the cattle line (and that is transportation)."

Altogether, Miss More and Mr. Moffatt have laid us under a deep obligation for this faithful picture of an excellent all-round naturalist and lovable man, whose painstaking industry will long inspire those who had the privilege of his friendship.

R. L. P.

WASP AND BEE HUNTING.

Hints on Collecting Aculeate Hymenoptera. By EDWARD SAUNDERS, F.L.S. London: Gurney and Jackson. (Reprinted from the *Entomologists' Monthly Magazine*, 1897.)

This useful little pamphlet should prove a great help to collectors and students of the Aculeata, the most interesting group in a fascinating but neglected Order. Not less may be expected from a writer recognised as the foremost British authority on the subject.

The "Hints" are intended almost solely as a guide to collectors, whose work must always precede that of students properly so-called, although both terms ought in practice to be synonymous. Mr. Saunders' experience as a collector has been wholly confined to a portion of England, and in certain respects the points he notes can hardly be held applicable to this island without some qualification. Thus on page 1 we find the statement:—"For collecting purposes the morning hours and mid-day in spring are by far the best; in hot summer the morning and later afternoon (*i.e.*, after 3 p.m.). The hours from 12 to 3 in very hot weather I have generally found most unproductive." Irish experiences do not entirely sustain these views. We have always found that nothing at all is to be taken in early morning in spring, and that the portion of the day between 12 and 3 in hot weather, especially in the sunny intervals of thunder-showers, yields the best results.

Every collector will endorse the author's remarks on the use of cyanide, but it would have been well to add that the chief value of the laurel-bottle is to keep specimens relaxed and in a fit state for setting, after they have been killed by chloroform or cyanide, and before they have had time to stiffen in the poison-bottle.

Mr. Saunders rightly discounts the usefulness of the ordinary hymenopterist's net in the capture of the *Pompilidæ*. We have always found a small net of strong muslin with a 5-inch ring most handy for these.

On page 10 we read:—"The species of *Mimesa* . . . are fond of flying round shrubs and settling on leaves after the manner of *Pemphredon*, but they also occur on flowers." *Mimesa unicolor* is most abundant in July on the sand-dunes at Laytown, Co. Meath, basking in the sunshine on bare sandy patches.

In his notes on the genus *Andrena* (p. 15) the author states;—"Senecio *Jacobææ* (Ragwort) attracts *A. nigriceps* and *tridentata* *A. denticulata* generally occurring on thistles." So far as we have collected we have never taken *A. denticulata*, a common insect in the south of Ireland, upon any plant except Ragwort.

A point which a hymenopterist cannot fail to note in this country is the rarity of the occurrence of *Nomada* with the second *Andrena* broods, and its non-occurrence with the very early members of that genus.

Every collector should take to heart the remarks with which Mr. Saunders concludes this valuable little reprint. These may be summarized thus:—When put away for preservation in cabinet or store-box no hymenopterous insect (and this applies to every insect with free wings) should ever be “carded”; anatomical points upon which specific differences rest, such as mandibles, tongue, armature, last ventral segment, etc., should be carefully dissected out; specimens should be mounted upon pins of uniform length, as high upon the pin as possible, and at a uniform level; and they should be distinctly labelled not only with generic and specific names, but also with date and locality of capture.

Few will be found to quarrel with the author's preference for store-boxes rather than cabinets, and none can disagree with his concluding words that “a collection neatly arranged, properly named, and carefully labelled, is of great scientific value, and at the same time a source of great pleasure to its owner.”

H. G. C.

NATURALISTS AND ADVERTISEMENTS.

The Naturalist's Directory, 1898. London: L. Upcott Gill, pp. 128+xii. Price 1s.

This little book contains the names and addresses of a selection of British zoologists, botanists, microscopists, and geologists, as well as a list of foreign naturalists who wish to correspond or exchange with British students. There is also a list of Natural History Societies, Field Clubs, Museums, and Magazines, and a catalogue of books and pamphlets published during 1897.

We regret that we cannot honestly say that the execution comes up to the design. It is hard to know on what principle the lists of names have been drawn up, when we look among the zoologists and fail to find Sir William Flower, Prof. Howes, Prof. Ray Lankester, and Dr. A. R. Wallace; turn to the botanists and miss Profs. D. H. Scott, S. H. Vines, and E. P. Wright (finding Mr. W. Carruthers' address still given as the British Museum from which he retired years ago); and finally discover that Prof. T. M'K. Hughes, Mr. Teall, Dr. Hicks and Dr. Henry Woodward are omitted from the geologists' and palæontologists' section. The catalogue of Societies and Field Clubs, and the Trade Directory are satisfactory, but a number of the most important foreign scientific serials are absent from the list of magazines. And why are advertisements printed on alternate pages with the text through a large section of the book? For our own part, nothing would so strongly incite us to avoid all dealings with the advertisers as the annoyance caused by this detestable practice.

BRITISH AND IRISH VERTEBRATE ZOOLOGY.

A Sketch of the Natural History [Vertebrates] of the British Islands. By F. G. AFLALO. Edinburgh and London, W. Blackwood & Sons, 1898. Price 6s. net.

The author of "A Sketch of the Natural History of Australia" has now turned his attention nearer home and has given us the benefit of his experience on British Vertebrates. There can be no doubt, that a book on the lines laid down by Mr. Aflalo was wanted. In many respects, the work before us indeed fulfils its purpose of giving, in concise form, an introduction to the handbooks to county faunas already published. It is well printed, there is a good index to the work, and the illustrations, though few in number, are mostly excellent, and there are few misprints. The story of the Hedgehog subsisting in the kitchen on *Cockchafers* (p. 37), we fancy comes under the latter category. But according to the title of the work, it purports to be a sketch of the Natural History of the British Islands; we should therefore expect to find reliable information on the vertebrate animals of Ireland, as well as on those of Great Britain. In this respect, however, the book is disappointing, as the author has not thought fit to acquaint himself sufficiently with Irish natural history. A mere look at the bibliography will show us that Mr. Aflalo does not know that a second edition of Mr. More's valuable list of Irish Birds was issued; and this edition has been in print now for eight years! When the author describes in glowing language that the huge Moose browsed on the forest trees of Ireland (p. 3), he is particularly unfortunate, since the "Irish Elk" (which we presume is the animal he means) was certainly an inhabitant of the open country—not the forest.

That the Irish Rat has always a white patch on the breast (p. 73), has been disproved some years ago by Messrs. Clarke and Barrett-Hamilton, who showed that it was present in only a small proportion of the specimens examined. That the Harvest Mouse is "all but unknown" in Ireland (p. 74) would lead one to suppose that it occurs in this country, which it certainly does not.

Any young Irish naturalist, anxious to take up the study of Reptiles or Amphibia, who wishes to know are there one or more species of Lizard in Ireland, only obtains the curt information (p. 302) that "Lizards are abundant," which is all the more unsatisfactory, as he learns by experience in the field afterwards that lizards are, as a matter of fact, decidedly scarce.

It has been shown years ago, that what was formerly regarded in Ireland as the Norway Haddock is really another species belonging to a different genus. Yet on p. 347 the author repeats the erroneous statement that the Norway Haddock lives on the Irish coast, and also (p. 348) that *Cottus gobio* is "in parts of Ireland exceedingly rare." No Irish specimen of the latter fish has ever been authenticated, and even Thompson disbelieved its reported occurrence in the North of Ireland.

The remark that the Blackfish and the allied *Centrolophus britannicus* "are small and rare fish on our coast" (p. 359) does not impart a vivid impression of the nature of these species. The specimens of the former in the Dublin Museum are over a foot long.

Again on p. 383 we read "it seems uncertain whether this fish (the Torsk) should find a place on the Irish list"; this is wrong, since this fine gadoid species has been taken a good many times on our coast, and is represented in the Museum collection by a magnificent specimen given by Mr. Green, H.M. Fishery Inspector.

These are a few of the more glaring misstatements made by Mr. Aflalo, and we venture to think that most of them might have been avoided if he had been a diligent reader of the *Irish Naturalist*.

R. F. S.

PROCEEDINGS OF IRISH SOCIETIES.

ROYAL ZOOLOGICAL SOCIETY.

Recent gifts include a pair of Lavender Poland Fowl from Mr. J. B. O'Callaghan, a Macaw from Mrs. Graves, a Sparrowhawk from Mr. J. O'Carroll, a pair of Leadbeater Cockatoos from Captain G. Nicholson, and a Common Fox from Mr. T. W. Wilkinson. Four Golden Pheasants and an Indian Monitor have been bought.

4,890 persons visited the Gardens during February.

BELFAST NATURALISTS' FIELD CLUB.

FEBRUARY 19.—BOTANICAL SECTION.—The monthly meeting of the Section was held when the subject studied was the Incompletæ. On account of the mild weather many specimens were obtainable with the catkins in flower. On the previous Saturday some of the members visited Killeen Glen and found *Pterygophyllum lucens* and *Hypnum pumilum* in fruit, as well as some early blooming specimens of flowering plants.

MARCH 12.—BOTANICAL SECTION.—The monthly meeting was held when the first portion of the orders of Monocotyledons included in the British Flora was considered.

DUBLIN NATURALISTS' FIELD CLUB.

MARCH 15.—The President, R. LLOYD PRAEGER, B.A., B.E. (in the chair), read a paper on the position of the fruiting organs in certain native Ferns and Horsetails. The paper was illustrated by lantern slides and specimens, and described a number of variations from the normal position of the fruiting organs. It will be published in full in an early issue. Messrs. W. de V. Kane, M.A., and A. V. Jennings, F.L.S., spoke on the paper. The paper was followed by a lantern exhibition of a large series of slides illustrating features of geological interest in different parts of the United Kingdom. Not a few were from Ireland, taken by Mr. R. Welch of Belfast. The series was described by Mr. Jennings, and Mr. J. H. Seymour, B.A., the newly-appointed Co-Secretary of the Club. A specimen of the fruit of the Strawberry tree (*Benthamia*) grown in the open air at Stillorgan was shown by Dr. T. Johnson for Miss Wann, and was illustrated by a coloured lantern-slide lent by Mr. Greenwood Pim M.A. Mr. Kane exhibited for Miss Hughes the case-bearing caterpillars of a clothes-destroying moth.

Miss Brooke, Mrs. A. H. Shackleton, and the Hon. R. E. Dillon were elected members, and three nominations for membership were made.

ON THE POSITION OF THE FRUCTIFICATION IN
CERTAIN BRITISH FERNS AND HORSETAILS.

BY R. LLOYD PRAEGER, B.E.

(Read before the Dublin Naturalists' Field Club, March 8th, 1898.)

THE Ferns and Horsetails are among the highest of the Cryptogamia or "Flowerless Plants." They display an alternation of generations. The sexual generation, or oophyte, is a minute and short-lived plant. The asexual generation, or sporophyte, is comparatively gigantic, usually lives for several or many years, and this is that we call a Fern or a Horsetail, as the case may be. These higher cryptogams have usually well-developed root, stem, and leaf, and on portions of the stems or leaves is borne the fructification, that is, the spores with their spore-cases and appendages. These spores, when liberated from the spore-cases, and surrounded by suitable conditions, germinate and produce again the sexual generation or oophore. The position of the fructification in the Ferns and Horsetails shows in different species a good deal of variation. In most of our British Ferns it is borne in small bundles on the back of the large and often much-divided leaves or fronds; in others of our Ferns only on a certain portion of the fronds, or only on certain fronds. In the Horsetails, it is borne sometimes at the top of the simple or branched green stems, sometimes on stems set apart for the purpose. Let us look into this matter in greater detail, considering not only the normal forms, but certain abnormalities, some examples of which are figured, and tend to throw interesting side-lights on the subject.

We should expect to find the fructification borne in that position which is most advantageous to the continued life of the species—in other words, in the position which is best suited for the proper ripening and dispersal of the spores. The spores must be duly protected from cold and wet, and at the same time they must be so borne that, when liberated, they will be freely exposed to the wind, on which the plant relies for their dispersal. These conditions we find duly fulfilled. To take first the Ferns. In the sub-order *Polypodiaceæ*, to which almost all our British species belong, the spore-cases are borne in clusters or *sori* on the under side of the leafy fronds. In the three species of *Polystichum* (Shield Fern, Holly

Fern), in *Polypodium* (Polypody), in *Athyrium* (Lady Fern), the many species of *Asplenium* (Spleenwort), in *Ceterach* (Scale Fern), *Scolopendrium* (Hart's-tongue), *Cystopteris* (Bladder Fern), *Pteris* (Bracken) and others, fructification is borne indifferently by all the fronds, or at least by all which receive a due amount of light and air. It is worthy of note that in all these the fructification is found chiefly on the upper portion of the frond, where the amount of light and air is greatest. In the genus *Lastrea* (Buckler Ferns) we find the first differentiation of fronds as regards the bearing of fructification. In *Lastrea cristata* (Crested Buckler Fern) and *L. Thelypteris* (Marsh Fern) fructification is borne by some of the fronds only. These fronds stand up perfectly erect, and bear on their backs abundance of sori, while the remaining fronds, whose main function is the process of assimilation, are shorter, less erect, and their divisions present rather broader surfaces to the light than those of the fertile fronds. In *Blechnum* (Hard Fern) this differentiation is more marked. The fertile fronds stand quite erect, their segments very narrow; the barren fronds lie almost horizontally, and have much broader segments of green tissue, where assimilation sufficient for the want of the whole plant may be carried on. Here we may note an interesting variety which shows that the two kinds of fronds are but modifications of the same plant-structure. The form known as *anomalum*, which may be found, for instance, about Newcastle, in Co. Down, has all the fronds intermediate in character. The segments are broader than in the normal fertile fronds, narrower than in the barren ones; the fronds all bear fructification on their upper half; and they all rise from the ground at an angle intermediate between that usually made by the barren and by the fertile fronds. The Parsley Fern (*Cryptogramme crispa*) also bears barren and fertile fronds, quite distinct in appearance, the latter rising more erect than the former. In the barren fronds, the pinnules are deeply cut and lobed, so as to be almost again pinnate. In the fertile fronds, the pinnules are narrow, undivided, recurved. If a series of plants be examined, barren fronds will be found in which the pinnules are undivided, being egg-shaped, with a scalloped margin. These appear to be, to use a hibernicism, barren fertile fronds. The pinnules are shaped as in the fertile fronds, but they produce no fructification, and are not reflexed.

The few remaining British Ferns show an arrangement of the fructification quite different from any of the preceding, and they belong to different sub-orders. In the *Osmundaceæ*, the fructification is borne in clusters at the extremity of the frond. The only British representative of the group is *Osmunda regalis*, the well-known Royal Fern, whose conspicuous fructification has earned for it the title of Flowering Fern. In this genus, the upper portion of the fronds, which are twice pinnate, is devoted entirely to the bearing of the sori. In the lower two-thirds or so of the frond the pinnules are green, leafy, and finger-shaped. In the upper third they are reduced to a narrow axis which bears along each margin close-grouped clusters of rich brown spore-cases. But in this plant again we find that there is no sharply-defined line between the barren and fertile portions.



Fig. 1.—*Osmunda regalis*—(from a cultivated plant).

A little search among a number of plants will generally reveal instructive intermediate pinnules, among which every stage may be traced from the broad green barren pinnule to the narrow brown fertile one. This is well shown in the figure (fig. 1) which represents a pinna taken from a large frond which had a fertile patch around the midrib a little above the middle of the frond.

The two remaining British Ferns belong to the *Ophioglossaceæ*, an aberrant group with affinities towards the Club-mosses. The stem is very short, subterranean, perennial, and sends up annually a green leafy frond, from the stalk of which springs an erect branch which bears the fructification. In weakly plants, or in situations that are too much shaded, the fertile branch is not produced. In the well-known Adder's-tongue, *Ophioglossum vulgatum*, the barren branch of the frond is undivided and egg-shaped in outline; the fertile branch is very narrow, and bears two rows of spore-cases



Fig 4.



Fig 3.



Fig 2.

Ophioglossum vulgatum. Shane's Castle, Co. Antrim,
R. Ll. P., 1891.

sunk in the tissue in its upper portion. Abnormalities are rare, but I once came across a field full of abnormal forms at Shane's Castle, Co. Antrim. Three of the most interesting

are figured. Many of the specimens which I collected there bore several fertile branches, as shown in fig. 2. These recall some of the foreign Adder's-tongues, such as the *O. palmatum* of South America, which normally bear a number of fertile branches springing from near the base of the blade or expanded portion of the barren branch. In a number of others the fruiting-spike was twisted on its axis, as is shown in fig. 3, the result of the undue growth of one side; and in the interesting specimen shown in fig 4, one side of the fruit-spike had actually grown out into a leafy expansion resembling in structure the barren frond. This accidental sport shows the affinity of the barren and the fertile branches, which are so different in appearance. They are no doubt derived from a common ancestral form. The one has become expanded, barren, to carry on to most advantage the process of food-making: the other has been reduced to a narrow erect axis, where the spores may most conveniently be matured and dispersed. The variety *polyphyllum* is distinguished by bearing one or even two additional barren fronds on the same root-stock.

The Moonwort, *Botrychium Lunaria*, resembles the Adder's-tongue in the relation of the barren and fertile fronds, but differs in that both are divided. The barren frond is pinnate, with fan-shaped segments more or less cut. The fertile frond is twice pinnate, and the brown spore-cases cluster on the branches somewhat as they do in the Royal Fern. Sports are rare, but not so rare as in the Adder's-tongue. Those that occur often display a certain symmetry. Thus a small fertile frond will be borne on each side of the normal one, from the point where it springs from the barren frond (fig. 5). Or a pair of small additional barren fronds will arise from the same point. Or, as in another specimen in my herbarium (fig. 6), the lowest pair of pinnæ of the barren frond will be themselves pinnate. I have never seen the fertile frond display any of the leafy growth that characterizes the barren frond, but the converse may be occasionally observed, and spore-cases be found placed on the margin of some of the fan-shaped segments of the barren frond, as may be observed in the lowest left-hand pinna of the specimen figured in fig. 6. This shows clearly the close relationship between the two kinds of fronds, so different in appearance.



Fig 5.



Fig. 6.

Botrychium Lunaria. Carrowreagh Hill, near Holywood, Co. Down,
R. L. P., 1891.

The Horsetails are plants with underground creeping stems, which send up at intervals jointed aerial branches, sometimes undivided, sometimes bearing whorls of simple or compound branchlets at each node. The spores are borne on a cone-like head at the summit of the stem. This fruit-structure may be compared to a short stick into which a number of large-headed nails have been driven, so that the heads of all the nails form a cylindrical or egg-shaped surface. The spore-cases are borne on the inner or under side of the heads of these nail-like branches. The leaves are in the Horsetails reduced to a series of dark-coloured minute teeth that surround each node of the stem. The process of assimilation is performed by the green stems and their branches. As in the Ferns, we find among the British Horsetails a considerable variation as to which stems bear fructification. In some, such as *Equisetum limosum*, or *E. hyemale*, it is borne by every fully developed stem, or by the majority of them; but in others, as the common Field Horsetail, *E. arvense*, and our largest species, *E. maximum*, it is borne on special stems. Two

points in this connection call for special note—firstly, the fact that in those species which bear special fructification-stems, these stems appear earlier in the season than the barren ones; and secondly, the power of the stems in those species which do not bear special fruit-stems to produce fructification on their branches, should the apex of the main stem, where normally the fructification is borne, be injured or destroyed. Let us take a few examples. The Water Horse-tail, *E. limosum*, is normally unbranched, bearing the egg-shaped fructification on the summit of its green jointed stem. In flowing water or in shady places it develops whorls of branchlets from the nodes of the upper part of the stem, and the fruit-cone is frequently replaced by a slender tapering stem-tip. Two cases have come under my own notice where the main stem having been injured, the branches produced an



Fig 7.

Equisetum limosum.
Found near Strabane,
Co. Tyrone, M. C.
Knowles, 1896.



Fig 8.—*Equisetum limosum*. Broughshane, Co. Antrim, R. Ll. P., 1891.

abundance of small fruit-cones, one at the extremity of each (see figs. 7 and 8). But in this species such instances are very rare. The adaptation to circumstances just described is much

more frequent in the Marsh Horsetail, *E. palustre*. This is a variable plant, the stems normally branched, but varying from quite unbranched to profusely branched. Should the main stem be injured, the branches often produce numerous small fruit-cones. Occasionally a quite uninjured specimen will be found (see fig. 9) in which the main stem terminates in a fully developed cone, and many of the branches likewise; a feature which has not been observed, so far as I am aware, in any other of our whorl-branched Horsetails. This is the sport--*variety* is a misnomer for it—that has received the name *polystachyum*. An example of it, collected on the shore of Lough Neagh in Co. Antrim is figured (fig 9). *Equisetum*

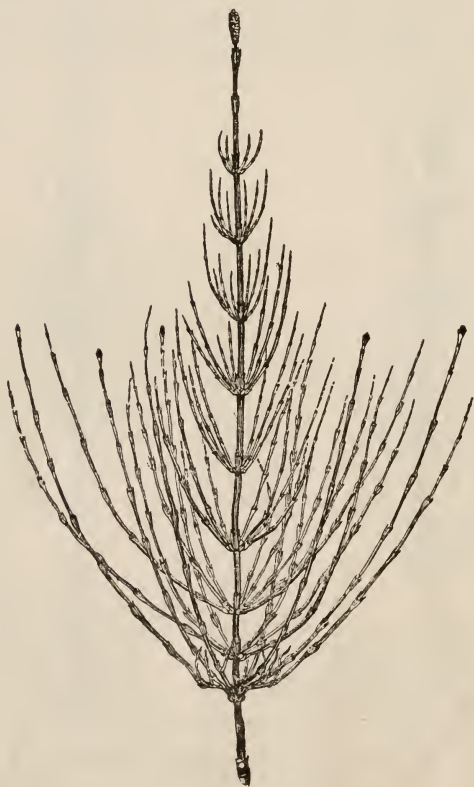


Fig. 9.—*Equisetum palustre*, var. *polystachyum*. Shane's Castle, Co. Antrim,
R. L. P., 1891.

hyemale, the Dutch Rush, has dark green "evergreen" stems, full of particles of silica or flint. It is very constant in the absence of branching of its tall stems, and sports are exceedingly rare. Dr. Boswell, in *English Botany*, mentions but a single aberrant specimen, which bore a branch near the apex



Fig 10.—*Equisetum hyemale*. Rocky River, Mourne Mountains, R. L. P., 1890.

of the stem. In 1890 I found several specimens on a river bank in the Mourne Mountains (see fig. 10), of which the upper part of the stem had been nipped off by sheep, and in consequence a fruit-cone which was practically sessile had been produced from each of the several nodes below the point of injury, on each side of the stem alternately. In most of the Horsetails, as we have seen, the branches, if produced at all, are in whorls. But in the species to which *E. hyemale* is allied—*E. trachydon* and *E. variegatum*—the branching is quite irregular; so that in the irregularly-borne fruit-cones of my abnormal stem of *E. hyemale*, the plant showed its affinity to its allies.

E. variegatum is the most protean of all our Horsetails in the matter of branching and fruit-bearing. It is sometimes

quite unbranched, like *E. hyemale*; but more frequently branches, which may be quite short, or may overtop the main stem, spring from the nodes, often singly, and never in whorls; and some of these usually bear fruit.

To turn now to the Horsetails which produce special fruit-stems. *E. sylvaticum*, the beautiful Wood Horsetail, can hardly be reckoned among these, but it furnishes a connecting link, since the fruit matures before the prettily divided green branches, and when the latter are fully grown the fruit is shrivelled and dry.

E. pratense, a rather local species, is a connecting link of a more pronounced type. The fertile stems, which appear in early spring, are quite unbranched at first, but eventually develop short green branches, shorter than those of the later barren stems. The fertile stems are, as in the two species next mentioned, shorter, and have larger sheaths, than the barren stems.

In *E. arvense*, the very common Field Horsetail, and *E. maximum*, the Great Horsetail, the fruiting-stems are quite different in appearance from the barren ones, being short, unbranched, with large loose sheaths; they are coloured pink and brown, and are mature in the month of March or April. The barren stems are taller, with close sheaths, and numerous whorls of green branches, and are not mature until a month or more after the fertile stems. Here we have a division of labour, the fertile stems devoted to bearing the spores at the time and place which is most advantageous, the barren stems appearing later to perform the process of assimilation when the conditions of light and heat are more favourable.

The stems have been specialised to best perform their respective functions, and they now differ not only in size and appearance, but also in the season of their maturity. This being so, it is to be expected that departures from these types, or intermediate forms, will be rare. In *E. arvense*, the all-too-common Field Horsetail, the barren stem varies much in shape according to the situation in which it is placed, but the fertile stem is very constant. I have never noticed any aberration in the latter, nor any instance of a stem of intermediate character, but instances of the latter do occur, and constitute the variety *campestre* of Schultz. In *E. maximum*

stems of intermediate character are not so rare. The fertile stem is normally 6 to 12 inches high, stout, pale-brown, with very large sheaths, and is mature when the barren stems are only commencing growth. The barren stem is 1 to 6 feet high, green, with numerous whorls of branches. The stems of intermediate character which I have found were produced a little later than the barren stems, and resembled small-



Fig 11.—*Equisetum maximum*. Found near Dundonald, Co. Down, R. L. P., 1896.

sized barren stems with a terminal spike of fructification (see fig. 11), which, as in *E. sylvaticum*, was ripe while the branches

are still only half-grown. This intermediate state is the var. *serotinum* of Braun. Figure 12 shows a remarkable sport found by Miss Knowles near Coleraine, in which a spike of fructification is borne on a stem resembling a normal barren stem, with whorls of branches above and below it. This specimen suggests that the cone-like fruit-spike is produced by the crowding together and modification of several whorls of branches or of leaves.



Fig 12.—*Equisetum maximum*. Found near Coleraine,
M. C. Knowles, 1894.

I have not the knowledge to discuss the morphological significance, if any, of the aberrations which I have just described. I merely wish to draw attention to the fact of the occurrence of these variations, and to the suggestiveness of some of them. A chance sport may cast an interesting light on the affinity and relations of the different parts of these plants, and on the path along which structures, now very different, diverged from a common ancestral form.

THE LONG-TAILED DUCK IN KILLALA BAY AND THE ESTUARY OF THE MOY.

BY ROBERT WARREN.

THE late William Thomson in his "Natural History of Ireland" considers this beautiful duck (*Harelda glacialis*, L.), "an occasional—probably a regular—winter visitor to the coast of Ireland in very limited numbers," and notes eleven specimens having been obtained in Belfast Lough at various times, between the years 1824 and 1848, and one at Killyleagh on Strangford Lough, in November of the former year. He also mentions six specimens obtained on the Dublin coast at different times up to 1848; two in Wexford in 1834, one at Lurgan Green, Co. Louth, in 1836, another at Galway, and three shot by the late Mr. R. J. Montgomery in Drogheda Bay, in the winter of 1848-9. The above was all that was known of this species as a visitor to the Irish Coast, up to 1851, the date of publication of Thomson's third volume.

To Killala Bay, this duck is an irregular winter visitor—some seasons appearing in October, and occasionally remaining until the first or second week in May, and during its stay, occasionally visiting the estuary and tidal parts of the river.

I first met this beautiful duck on the 26th of March, 1851, in the channel near Bartragh, when my attention was attracted by the wild, musical calls of the birds, so totally unlike those of any duck I had ever heard before, and when my brother and I got out our boat, and rowed to where we had heard the peculiar calls, we saw a lovely pair (male and female) diving in the channel, and we thought at the time the adult male was one of the loveliest ducks we had ever seen. We saw them again on the 6th and 9th of May, near the same place, but on neither occasion were we able to shoot them, although we repeatedly tried to approach within shot. These birds shortly after left the river for the season, and until the 12th of the following December I did not observe any, but on that day I saw a flock of eleven birds in the channel near Killala, at the western end of the island of Bartragh, and strange to say, the greater number from their light-coloured plumage appeared to be males. They were very lively and noisy, playing about, and taking short flights after diving, always

calling when on the wing so that the air resounded with their wild musical cries, which will always attract the attention of the observer, they are so utterly unlike the calls of any of our native ducks. My next meeting was on the 6th of February, 1852, when I saw two small flocks of four and five birds each, feeding in the channel near the Killala bar. On the 10th of April a beautiful adult male was seen between Moyview and Bartragh. From that date none were observed until the 29th of March, 1853, when, as I was going to Bartragh, I met a lovely adult pair, male and female, both of which I shot as they flew round my boat. On the 19th of April I shot an immature male near the same place, and on the 25th of same month, as I was walking along the edge of the channel near the Moy bar, I observed a flock of fifteen birds feeding close to the breakers. None were afterwards seen until 1856, when on the 31st of October a large flock of nearly fifty birds were observed feeding in the channel of the Moy, close to the rough water of the bar. For two years after, none came under my observation, until the 10th of December, 1858, when I shot an adult female near Bartragh. Early in January, 1859, I shot another fine specimen, a male; and on the 20th of March I obtained a beautiful adult pair, male and female, as they were diving in the channel close under Moyview. On the 3rd of December, 1861, I shot another old male near Bartragh. From that time I only noted those I shot, for I looked on them as becoming common, to be seen nearly every year, if looked for in their favourite feeding-grounds, near the Moy and Killala bars. After the winter of 1861, my shooting punt being very old and rather unsafe, I did not shoot so much on the estuary as usual, and had not the opportunity of observing these birds in their haunts. But it appears that after 1868, they became very irregular and rare in their visits, and on asking my friend the late Captain Dover, who shot regularly with punt and gun on the river and estuary from 1868 to 1876, he said that he very seldom met any during that period, and that when he did, only a pair or a solitary bird appeared.

In 1874 I again began to shoot regularly with my punt-gun, and have done so every year since, and, to my great surprise, have seldom met Long-tailed Ducks; and, as I have noted all I observed, or heard of, the number up to the present is very

small indeed, compared to the numbers seen previous to 1868. On the 18th of February, 1875, I met a pair in Killala pool (apparently adults), and on the 23rd of April I met (probably) the same pair in Moyne channel, and shot the female. In October, 1880, Mr. F. B. Henn, R.M., shot a young male on the river within a mile of Ballina. On the 3rd of December, 1881, when Widgeon-shooting near Bartragh, I met a pair in the channel; and on the 22nd, near the same place, managed to obtain both by a shot of my cripple-stopper—an immature male and female. Again, on the 31st of December, 1883, I saw a young male with some Mergansers in the Moyne channel, near the abbey, but owing to the wildness of the Mergansers was unable to get a shot. None were afterwards seen until the 25th of October, 1886, when I observed either a young male or a female in the channel near Goose Island; and on the 6th of January, 1887, probably the same bird was seen near Moyne Abbey. On the 18th of November of same year a bird in a similar state of plumage was seen near the same place. Lastly, on the 23rd of November, 1894, I saw a female near Bartragh. Nothing more was seen, or heard of any, until the 10th of last November, when my friend, Mr. A. C. Kirkwood, of Bartragh, shot a young male. From the foregoing notes it will be seen that from 1851 to 1868 the Long-tailed Ducks visited the bay and estuary more frequently, and in larger numbers, than from the latter date up to the present year of 1898.

It is difficult, if not impossible, to explain why the Long-tailed Ducks have so rarely, and in such small numbers, visited the bay and estuary since 1868. Their feeding-grounds appear to be unchanged, and are not more disturbed by fishing boats than they were previous to that date. So the cause of their absence is quite unknown. They have not escaped notice through want of observation, for both my friend, Mr. Kirkwood, of Bartragh, and myself, are always on the lookout for strange visitors when out in our shooting-punts, and it is impossible that any of these birds could frequent their feeding-grounds unnoticed by us. Indeed, I consider one of the great charms of punt-shooting is the hope of seeing some rare bird turn up unexpectedly when pursuing Widgeon or ducks, and then the excitement of trying to outmanœuvre the stranger and get within shot, and the crowning triumph felt when the bird is obtained.

Some writers speak of the wildness of this duck, and of the difficulty of shooting it; while others speak of its ducking the flash when fired at. In my experience of the bird, I have never found much difficulty in obtaining specimens when required, provided they were alone, and not in the company of Mergansers. My usual plan was to get above the tide, and let the boat or punt drift down quietly on them, then just before coming within shot, the birds, instead of diving, would rise, and fly half round the boat as if wishing to obtain a better view of what had disturbed them before passing down the channel, and, as they flew round, generally within shot, I seldom failed in securing one or two.

Moyview, Ballina.

NOTES.

Spring Flowers and Birds.

The Blackthorn and Wild Anemone were in flower here on March 29th; the Coltsfoot as early as February 23rd, on which day the Chaffinch sang. The Cuckoo was seen on April 11th, the Corncrake heard on the 12th, and the Swallows noticed on the 16th.

S. A. BRENNAN.

Knocknacarry, Co. Antrim.

ZOOLOGY.

CRUSTACEA.

British and Irish Entomostraca.

In the *Nat. Hist. Trans., Northumberland, Durham, and Newcastle-on-Tyne* (vol. xiii., 1898, pp. 217-248, pls. vii.-x.), Prof. G. S. Brady publishes a valuable paper on the British species of Entomostraca belonging to *Daphnia* and other allied genera. His descriptions and figures will be most useful and should encourage students to take up the study of this interesting but neglected group of tiny crustaceans. Among other correspondents Dr. R. H. Creighton, of Ballyshannon, has sent specimens to Prof. Brady; and we notice records of *Daphnia galeata*, G. D. Sars, from Lough Melvin, and of *Hyalodaphnia Kahlbergensis* (Schoedler) from Lough Erne.

BIRDS.

Ferruginous Duck in Ireland.

Mr. F. Coburn records in the *Zoologist* for January, 1898 (p. 25) the discovery of a specimen of the Ferruginous Duck (*Fuligula nigroca*) from some unknown locality in the south of Ireland, offered for sale in the Market Hall, Birmingham.

Spotted Crake in Co. Wexford.

On November 2nd, 1897, a Spotted Crake (*Porzana maruetta*) was shot in the marsh lands of Ballymagir, near Kilmore, Co. Wexford. The Rev. Paul E. Kehoe, to whose gun it fell, sent it to Wheelocke's of Wexford, and it was by that firm sold to an unknown person who happened to be passing through Wexford at the time. I regret that I am unable to trace the bird further, as it is an interesting addition to our Wexford avifauna. I have no doubt whatever as to its having been correctly identified, since it was seen not only by the above-named persons, but also by my friend, Mr. G. A. Gibbon, in whose identification of the species I have perfect confidence.

G. E. H. BARRETT-HAMILTON.

Kilmanock, New Ross.

MAMMALS.

The Harvest Mouse.

It is stated by "R. F. S." in the last number of the *Irish Naturalist* (p. 107), that the Harvest Mouse is not a native. A lad, who is a servant of mine, tells me he found, in the autumn of 1894, in the townland of Balleeghan, Lough Swilly, Co. Donegal, a nest of young mice in a thistle growing in a field of oats—the nest, my informant states, was like a wren's—he recognised it at once when I showed him Fig. 4 Cassell's "Natural History."

S. A. BRENNAN.

Knocknacarry, Co. Antrim.

The occurrence of the Harvest Mouse in Ireland has frequently been reported, but when the specimens were carefully examined, they always turned out to be either the Shrew or the Field Mouse. Both of these often construct nests, and though the situation of the one described by Mr. Brennan would be a very unusual one for either of these species, we are not warranted in including the Harvest Mouse among the Irish animals on the strength of this evidence. I wish Mr. Brennan would send the next nest he finds to the Dublin Museum, so that it may be critically examined.

R. F. SCHARFF

Science and Art Museum, Dublin.

The English Hare in Ireland.

I am glad that Mr. Barrett-Hamilton has given us an account of his interesting observations (*Irish Naturalist*, March, 1898), on the introductions of the Brown or English Hare (*Lepus europæus*) into Ireland. They tend on the whole to support the hypothesis, that a spirit of antagonism exists between the English and the Irish Hare, but further observations are needed on the subject.

The success of the Strabane introduction, says Mr. Barrett-Hamilton, is alone a sufficient proof of the power of the English Hare to become permanently established. In this case, however, Mr. Herdman, who introduced the hares, expressly states that, in his part of the country there were no Irish Hares in the lowlands, so that the aliens had no trouble with the native hare to start with. Altogether, the artificial surroundings in which these introductions are generally made, do not give us a good idea of what would happen if both species met under perfectly natural conditions without human interference.

R. F. SCHARFF.

Science and Art Museum, Dublin.

PROCEEDINGS OF IRISH SOCIETIES.

ROYAL ZOOLOGICAL SOCIETY.

Recent gifts include a pair of Manx Bantams and two Pekin Bantams from Mr. J. B. O'Callaghan, a sparrow hawk from Master H. Neville, a parrot from Miss K. Barlow, a monkey from Mr. F. Colin, and two cockatoos from the Marquis of Ormonde. A striped Hyena, a Wapiti Deer, two Golden Lion Monkeys, a Mantelli Apteryx, a Gannet and a Sea-lion have been bought, while two Golden Agoutis and two Aomdads have been born in the Gardens.

5,355 persons visited the Gardens during March.

The Annual Report of the Society (for 1897) has recently been issued. An increase of 6,000 in the number of visitors to the Gardens as compared with the preceding year is an encouraging feature, but the Council regret that the number of annual subscribers is by no means as large as might reasonably be expected. A deputation to the Treasury in February, 1897, to solicit a Government grant towards the erection of necessary new buildings was unhappily not successful. The Aquarium House, with its interesting collection of reptiles and diving-birds, was opened in March, by the Countess Cadogan, and has been extremely popular with visitors. One of the Jackass Penguins in this house laid two eggs in May, but they did not hatch out. The new Camel and Llama House has been finished, and great pains having been taken to secure a dry site, the health of the animals has greatly improved. The Chimpanzee and the rare Hainan Gibbon, both of which have lived in the Gardens since 1895, have received increased space and are in

excellent condition. Lion-breeding has been less successful than usual; two litters were born, but all the cubs died shortly after birth. Two female cubs have been exported from Somaliland, and a fine young lioness has been introduced in place of "Juliet," who has been sold; so it is hoped that the reputation of the Gardens for lion-breeding will be maintained in future. The Report closes with a reference to the loss sustained by the Society in the death of the late Rev. Dr. Haughton, and a proposal for a memorial building to be erected in the Gardens, which shall bear his name. We regret to notice in the financial statement a debit balance of over £400.

DUBLIN MICROSCOPICAL CLUB.

At the Annual Meeting of the Club, held January 13th, 1898, it was decided that the time had arrived when, on account of the members' houses being so far apart, it was desirable to meet at some central place in town. A small Committee was appointed to draw up suggestions for the conduct of the Club under the new system, and to report to the next ordinary meeting, which would be held at Dr. Frazer's on 20th instant.

The Club accordingly met at Dr. Frazer's on Thursday, January 20th, and the Committee having presented their report, agreed that:—

The Club should continue as heretofore to be the Dublin Microscopical Club.

The Meetings should be held on the third Thursday in each month (except August and September), the place of meeting to be the Royal Dublin Society (if permission could be obtained). Tea to be served at 7.45 p.m., business to commence at 8 p.m.

It was unanimously resolved that the officers for 1898 be—President, William Frazer, F.R.C.S.I.; Vice-President, Arthur Andrews, J.P.; Hon. Sec. retary, Greenwood Pim, M.A.; Hon. Treasurer, F. W. Moore, A.L.S., M.R.I.A.

A series of rules for the conduct of the Club were then agreed to.

The first meeting of the Club under the new arrangements was held in the Council Room, Royal Dublin Society, on Thursday, March 17, 1898. Dr. FRAZER, President, in the Chair.

Prof. G. A. J. COLE exhibited a section of chlorite-schist from Rimogne, France, to show the abundance of minute crystals of rutile in this class of rocks. The geniculated and heart-shaped twins are clearly seen among the transparent yellow-brown crystals in this particular rock.

Prof. JOLY gave a demonstration of the brilliant colours displayed by certain crystals of anatase when viewed at certain angles respecting the incident light.

Mr. H. J. SEYMOUR exhibited a number of rutile crystals which had been isolated by Mr. Ramage, from a mica-schist from Switzerland and given to him for identification. The crystals, which were very small, showed the various forms which are characteristic of rutile very distinctly.

Mr. PIM showed, as an opaque object, a fragment of *Azolla*, which in the open air in his garden had assumed an unusually deep red colour. Under a very low power this formed an exceedingly beautiful specimen.

Mr. M'ARDLE exhibited *Radula Carringtoni*, Jack., which he collected at Torc Waterfall, Killarney, in September last; this had been exhibited at the December meeting of the Club as an unnamed species, but has since been identified. He also showed photographs of the male and female plants by Mr. G. Pim, F.L.S. Specimens bearing mature perianths have not previously been found.

Mr. HENRY H. DIXON showed specimens of *Diffugia thalassia* in conjugation. This species of *Diffugia* was found by Dr. Joly and the exhibitor in large quantities in the surface water of Dublin and Killiney Bays during last summer. It differs from previously described *Diffugia* in its marine habitat and in the fact that the foramen, through which the pseudopodia are protruded, is surrounded with a silicious collar. The test is indurated with irregular silicious particles among which occasionally coccoliths and fragments of sponge-spicules are found. The conjugating forms exhibited resembled closely those figured by Wallich and Leidy from a fresh-water habitat.

Dr. M'WEENEY showed a hanging-drop-culture of the Typhoid Bacillus in broth, to which had been added 10 per cent. of serum from a patient suffering from typhoid fever. The culture had been started that morning and had been meanwhile kept at 37° C. The bacilli had multiplied enormously, and many of them had grown into tangled filaments owing to end-to-end arrangement of the individuals. This behaviour was due to the unfavourable influence exercised upon them by the specific serum, and was obtained with sera as yet too feeble to give a positive reaction with the Gruber-Widal method as ordinarily applied. It constituted, in the exhibitor's opinion, a valuable method of determining the existence of typhoid fever where, either though the early period of the disease or for any other reason, the usual tests failed to give definite results.

Prof. T. JOHNSON showed a preparation of Japanese paper recently introduced for Christmas cards, &c. The paper shows on one side the fibres of the Paper Mulberry (*Broussonetia papyrifera*), and on the other side a very thin radial longitudinal section of the wood of the Royal Japanese plant (*Paulownia imperialis*), a tree noteworthy for its fine foliage.

On the motion of Prof. Johnson, seconded by Mr. Andrews, a cordial vote of thanks was passed to the Council of the Royal Dublin Society for permitting the Club to hold its meetings in the Council Room.

Three new candidates for membership were proposed.

15

WILD-FLOWERS IN A COUNTY DUBLIN GARDEN.

BY EMILY M. TATLOW.

DELBROOK lies about a mile south of Dundrum, near the foot of the Three-Rock Mountain, at an elevation of 300 feet.

When we came to it eight years ago the place was a blaze of Cowslips, and later on the fields were here and there dotted over with the pretty pink stars of the Centaury. At the side of the house rose a forest of Nettles at least eight feet high, along the edge of an old hedge and ditch.

The Nettle-forest now forms my rock-garden; the hedge is cleared away; while the ditch, widened and filled with water, is the home of the Water-Violet and many other interesting aquatics. The spot selected for the rock-garden was the most unpromising piece of ground in the whole place, but circumstances at the time combined to make it the only spot available for the purpose.

Successive years have led to the discovery of several interesting native plants in our meadows, and it was this fact that suggested the idea of collecting wild-flowers from other places, and trying the experiment of cultivating them in my garden. I cannot say how much it has added to the pleasure of our rambles, both at home and abroad, to have this object in view. It may happen that a few notes upon the more uncommon plants which are indigenous here, and also on rare native species which we brought into cultivation may be of interest to some readers of the *Irish Naturalist*.

To commence with plants which grow wild about Delbrook. Among the orchids, the first to appear are the Early Purple (*Orchis mascula*) and the Green-winged (*O. Morio*), both of which grow in the adjoining meadows.

A little later comes the Spotted Orchis (*O. maculata*), and last year we found the Frog Orchis (*Habenaria viridis*) in our own meadow. With it grows the Pyramidal Orchis (*O. pyramidalis*) in abundance. The flowers of the last are bright purple in the meadow, and pale pink under the trees. Last, but not least, is a very healthy specimen of the Bee Orchis (*Ophrys apifera*), which produced one flower-stem in 1896, and two in 1897. So far, our efforts to find other plants

of this lovely species have not been successful, but its uncertainty of appearance is well known.

The Cowslip is abundant here, and the only reason for mentioning it is the occurrence of interesting colour-varieties, varying from pale primrose-yellow to the deepest crimson ; on one occasion we found a hybrid between the Cowslip and the Primrose.

Another plant of our field is the Adder's-tongue (*Ophioglossum vulgatum*), which grows in profusion, and we once found its rarer congener, the Moonwort (*Botrychium Lunaria*), in the adjoining grounds of Moreen.

We have one rare grass native in the place, *Poa nemoralis*, which grows on the edge of the tennis-ground, and also under the trees ; another grass, *Brachypodium sylvaticum*, has taken possession of a rough bank near the stream, and with a native Sedge, *Carex vulpina*, forms handsome tussocks along the water's edge. The Great Hairy Willow-herb, *Epilobium hirsutum*, having been banished from the water, has revenged itself by taking possession of the top of a dry bank adjoining, where, strange to say, it flourishes exceedingly. Of other native plants worth mentioning, the rare Ragweed, *Senecio crucifolius* (in Ireland practically confined to County Dublin), grows by the roadside outside our gate ; and the pretty little Three-nerved Sandwort, *Arenaria trinervia*, made its appearance last year in the fern-garden.

With less claim to be considered native, there is the Night-flowering Catchfly (*Silene noctiflora*), which appeared two years in succession in one of the beds, but probably came with other seed.

Natives at Delbrook are also the Wood-Sage (*Teucrium Scorodonia*), the Creeping St. John's - wort (*Hypericum humifusum*), and the Rest-Harrow (*Ononis arvensis*).

To pass now to the British plants which we have cultivated, we may begin once more with the beautiful Orchids. My friend, Mr. Praeger, on his botanical explorations, has seldom failed to return with some roots when they could be spared ; and one of the greatest treasures is *Neotinea intacta*, the Close-flowered Orchid, though by no means as handsome as some of the other species : its interest lies in its rarity, being, in fact, only found, as regards the British Isles, on a limited area in Clare and Galway. My plants were brought to me from

Ballyvaughan, and they have flowered well for the last two seasons, and are now (May 20) again in bloom.

A single plant of *Spiranthes Romanzoviana*, from Co. Londonderry, has not been so successful, but is, I hope, alive. *S. autumnalis* has not, upon a first attempt, succeeded. Of *Habenaria* I have five species, all of which are doing well. The Greater and Lesser Butterfly Orchis (*Habenaria chloroleuca* and *H. bifolia*), the Sweet-scented Orchis (*H. conopsea*), got from Kelly's Glen some two miles away, are all doing well, and also a pretty white variety of the last-named. The rarer *H. albida* is also thriving, and the Frog Orchis (*H. viridis*) this year came into flower in February, and is blooming still. Several colour-varieties are worth mentioning, such as white *O. maculata*, white *O. pyramidalis*, and beautiful pale varieties of *O. Morio*, from Fethard, Co. Tipperary, which, in their delicacy of colour, vie with some of the hot-house Orchids. The Tway-blade (*Listera ovata*) grows freely, but I was not successful with a single root of the lovely Lady's-Slipper (*Cypripedium Calceolus*), which was sent to me from England.

I brought a number of the rare Purple Helleborine (*Epipactis violacea*) from the limestone pavement of Arncliffe in Lancashire, and although it keeps small it flowers well. *E. palustris* has not done on a first trial, but this was, no doubt, on account of insufficient attention being paid to the fact that its underground stems creep extensively.

We have grown many water-plants, but are seriously handicapped by the drying-up of our stream during summer droughts. Both species of Reed-mace (*Typha angustifolia* and *T. latifolia*) grow splendidly, and curiously enough both species appear to be equally at home in two feet of water, and on the gravel walk adjoining. The former came from Lough Erne, and the latter from Courtown Harbour in Wexford. We are getting together by degrees all the large native Sedges. *Carex riparia* came two years ago from Portmarnock, and *C. paludosa* from Co. Meath; *C. aquatilis* from Windermere, and *C. pendula* from Bray. All are flourishing, and form exceedingly handsome plants; indeed, I can strongly recommend their introduction into gardens where wet ground is available; especially in swampy places where nothing else will grow.

The Great Spearwort (*Ranunculus Lingua*) and the Great Water-Dock (*Rumex Hydrolapathum*), we got on the banks of the Boyne on a Field Club excursion to Bective, and from the same place came the Sweet Flag (*Acorus Calamus*). All are growing well, and the latter flowered last year.

The little Water-Crowfoot, *Ranunculus trichophyllus*, came from Clondalkin ; it flowers year by year, and now the rare *Potamogeton densus* has appeared, probably introduced along with plants from the Royal Canal.

The feature of our pond is, however, *Hottonia palustris*, the Water-Violet, introduced three years ago from Downpatrick, and which in the early summer is a sheet of pale pink blossoms. Although one might think this a delicate plant, it has survived several catastrophes, including severe drought, which left not even mud at the bottom of the pond, and a well-meaning but mistaken attempt to exterminate it on the part of an over-enthusiastic gardener.

Another group of plants in which I am much interested is the alpine. I need not mention in this sketch any of the lovely ones brought home from the Austrian Dolomites, the Engadine, and other such places. British alpine are unfortunately few in number ; Irish alpine still fewer, but some of the most interesting are quite at home with us.

The Bearberry (*Arctostaphylos Uvi-Ursi*) from Benlettery, Ballyvaughan, and Achill Island is doing well. The Spring Gentian (*Gentiana verna*), from Gentian Hill, Galway, produced last year an abundance of flowers, and is now again studded with glorious blue stars. The Mountain Avens (*Dryas octopetala*) from Clare, has grown freely, and the rare *Saxifraga Sternbergii* from the Aran Islands sows itself, and is now flowering in profusion.

One or two alpine got among the English lakes are worth mentioning. *Draba incana*, so rare in that district, has grown splendidly, and sows itself abundantly. *Thalictrum alpinum*, the tiny Alpine Meadow-Rue, is growing well ; it flowered last year, and is now again in blossom. This, I may mention, I was defied to grow by a well-known English botanist, who was somewhat surprised two years later when he found it quite at home here !

The Rose-root (*Sedum Rhodiola*) and the Yellow Mountain Saxifrage (*S. aizoides*), Alpine Lady's-mantle (*Alchemilla*

alpina), and *Primula farinosa* are plants which offer no difficulty to the horticulturist, and they all grow well with me.

I have already mentioned some rare and peculiar plants which characterize the western coasts of Ireland; others which I have are *Erica mediterranea*, brought from Roundstone in 1895, which is growing well, and has flowered from last February till the present time; I also got it this year at Achill Island. The rare Whorled Caraway (*Carum verticillatum*) came unnoticed from Kerry with *Pinguicula grandiflora*. The *Pinguicula* is gone, but the *Carum* remains. *Potentilla fruticosa* came from Ballyvaughan, *Arabis ciliata* from the Great Island of Aran; this plant grows luxuriantly and produces abundant seedlings. The fine grass *Calamagrostis Epigejos* came from the same place, also the Maiden-hair fern, which has formed splendid plants; *Daboecia* from Recess is growing, but so far has not increased.

We are strong in native Geraniums or Crane's-bills; *G. Robertianum*, *pyrenaicum*, *molle*, and *dissectum* are native in the place; *G. pratense* I brought from Dunluce, and *G. sylvaticum* was sent from Glenarm; *G. columbinum* and *G. rotundifolium* Mr. Praeger brought me from Ballyvaughan. These last two are annuals, but sow themselves freely. On account of the mildness of last winter they have been flowering without interruption from June, 1897, till the present time. *G. lucidum*, another annual, has spread like wildfire, and decorates every piece of rock-work in the place. *G. sanguineum* I got at Howth, and its variety *lancastricense*—well, I bought *that* at a nursery! Of their allies the Erodiums or Stork's-bills, two species run riot. *E. maritimum* from Bray Head is quite a pest in one bed; and *E. cicutarium*, and a white-flowered variety, appear every year.

Of other seaside plants the Horned Poppy from the Murrough of Wicklow produces, each year, branches three feet long, and the Tree-Mallow from the Co. Down coast is forming large bushes. The Seaside Meadow-Rue (*Thalictrum dunense*) from Courtown, grows beautifully; its ally *T. montanum* is beside it, and the tall *T. flavum* from Beauparc has shot up four feet high in all parts of the dry bed in which it grows. *Juncus acutus* was brought from Brittas Bay, Co. Wicklow, but strange to say it seems to be suffering from a

stroke of paralysis, as, though green and fresh, it has only grown an inch in a year and a half.

The rare *Medicago sylvestris*, brought from Portmarnock by Mr. Praeger, before its identity was established, grows freely, and the Madger, *Rubia perigrina*, from Howth, forms a low evergreen bush. Poulaphoooca supplied me with the Yellow Dead-nettle (*Lamium Galcbedolon*) which spread rapidly, and is one of my earliest and prettiest spring flowers; also with the Water Avens, *Geum rivale*.

The Teazel is thoroughly at home in one large rough bed, and every year its stems, about seven feet high, form one of the features of the grounds. In the same place the Great Mullein is growing to an even greater height. The Artemisias are certainly handsome native plants, and we have all the local species growing here. The Mugwort (*A. vulgaris*) and the Absinthe (*A. Absinthium*) came from Kilmacannoge, and the rare *A. maritima* from Portrane. All grow freely, along with the still rarer *A. stelleriana*, from the North Bull.

Among other miscellaneous natives which I have brought home or received from friends at one time or another are the Common Buckthorn (*Rhamnus catharticus*), and the White Beam-tree (*Pyrus Aria*) from Lough Ree; the Wood Betony (*Stachys Betonica*) from Kilrea, the Nettle-leaved Bell-flower (*Campanula Trachelium*) from Kilkenny; the Red Catchfly (*Lychnis diurna*) from Poulaphoooca; the Evening Catchfly (*L. vespertina*) from Portmarnock; the Black Horehound (*Bullota nigra*) from Co. Down; the Cross-wort (*Galium cruciatum*), and the Petty Whin (*Genista anglica*) from Lancashire; and the Chamomile (*Anthemis nobilis*) from Enniskerry. The Sea-Campion is one of our handsomest rock-plants, growing in sheets over the grey stones.

Two plants may be mentioned on account of the extraordinary way in which they have spread themselves, viz., the Musk Mallow (*M. moschata*), and the Purple Toadflax, *Linaria purpurea*, which has grown to be a regular pest—indeed, it is the worst weed in my garden, but it is likely to be run close this year by the Fairy Flax (*Linum catharticum*), which I see coming up in alarming abundance.

Dundrum, Co. Dublin.

IMPRESSIONS OF ACHILL.

BY MEMBERS OF AN EASTER PARTY.

LEPIDOPTERA.

FROM an entomological point of view, a visit to Achill in Easter week could not be expected to produce much except to the coleopterist, who gathers his harvest in winter as well, though not as abundantly, as in summer. And at any time of the year the fauna is restricted to mountain, moor, and shore species, there being no trees to nourish arboreal insects, nor herbaceous flora except what is suited to moorland. Nevertheless, careful search on the sandy and boggy shore resulted in the capture of both sexes of *Nyssia zonaria*, by the Hon. R. E. Dillon and myself, but this interesting moth was very scarce and probably would have been overlooked had it not been that the trained habits of observation of our intelligent naturalist landlord had led to his detection of one of the curious wingless females of this species, which he sent to the Natural History Museum for identification, and so added an additional locality to the records of its Irish distribution. Found only in one spot on the Cheshire coast, it has been a most interesting addition to our knowledge to discover that it exists in Ireland also, and has a wide range.

At Roundstone in 1896, the Easter excursionists found a prolific colony, and at Slyne Head a few miles away. Here, in Mayo, it is also found to occur, though apparently in small numbers. And near Fair Head, in Antrim, several years ago, Mr. David Campbell, of Derry, discovered the larvæ in some numbers. The dispersal thus ascertained of so sluggish an insect, whose female is incapable of flight, indicates a vast extent of time to have elapsed since its first arrival on our shores. For this species appears to cling to the coast-line in Great Britain, and can scarcely be thought to have crossed from Antrim to Galway by foot through the interior of the country, except possibly at a period long anterior to the growth of the forests which are known to have anciently clothed the greater part of both mountains, bogs, and plains of Ireland. No doubt the fauna and flora of mountain and coast approximate strangely in many instances, but the

inland region between Antrim and Galway does not lend itself to the acceptance of this theory of dispersal. It would, therefore, seem probable that some of the extensive sand-hills on the coast-line of Derry, Donegal, and Sligo will be found to preserve occasional settlements of this *Nyssia*, by which the primeval route of the migrating host may be indicated. It is, however, so extremely local in its habits, that an entomologist who is acquainted with its life-history, finds it difficult to conceive how the race could wander even the length of one county in thousands of years. An interesting accidental find in the hotel by Mr. Dillon, was a late specimen of *Cheimatobia boreata*, a moth little known in Ireland. A few lepidopterous larvæ of no importance were seen; also cocoons of *Saturnia pavonia* among the heather. So far as the cliffs were concerned, no trace was met of *Silene maritima*, the food-plant of various species of *Dianthaciæ*, of whose existence, therefore, no indications could be observed; though several are usually found along the western coast-line. But the large area of *Empetrum nigrum*, on Minawn and Slievenore, accompanied by other alpine plants, suggest that a search in summer for the imago, or for the pupæ by an expert, might be rewarded by the discovery of *Pachnobia hyperborea*; as it should not be forgotten that an imago of this Scottish species emerged in the breeding-cage at Clonbrock some years since; presumably taken as a larva from a bog adjacent where the food-plant grows. Also it may well be expected that in mid-June the southern slopes of some of these Mayo mountains may be haunted by *Erebia epiphron*, an alpine butterfly, and discovered on Nephin, in the same county, last June, by myself; first recorded from Croagh Patrick, by Birchall. Lastly, it may be expected that sand-hill *Agrotidæ* may be plentiful in Achill, and, perhaps, show in the case of *A. cursorca*, the interesting variations usual near Sligo. But heather and bog frequenting insects are not likely to be very plentiful, as there are too many half-starved cattle wandering about the lower levels evidently (and literally) on "short commons," so that the bog plants are very closely cropped.

W. F. DE V. KANE.

Drumreask, Monaghan.

COLEOPTERA.

ACHILL is a typical locality for anyone wishing to become acquainted with our western fauna. There is a fine mountain range reaching in Slievemore a height of over 2,200 feet, numerous lakes and sandy bays with sandhills in the north-east. Much of the island is covered by bog, not very attractive to the entomologist, except where it abounds with birch and willow as in many parts of central Ireland. For almost all branches of entomology, Easter is too early to begin field work; indeed it is amongst the beetles alone that a list of 170 species could have been the result of a few days work at this season of the year.

It was satisfactory to be able to prove during our short stay, that the Achill mountains possess a fairly representative alpine fauna, and it is the presence of such that probably accounts for the preponderance of northern forms amongst the local species. On Slievemore some interesting discoveries were made, notably the rare ground-beetle, *Lcistus montanus*. This beautiful species occurred sparingly from an elevation of over 2,000 feet to the summit, but it seemed to be absent from the lower slopes, where its place was supplied by the common *L. fulvibarbis*. Another pleasant surprise was the northern weevil *Otiorrhynchus maurus*; living examples were exceedingly rare, but the remains, in a fair state of preservation, were abundant under stones. This is the first western record for this fine species, which has long been known from Slieve Donard; and I have just seen a specimen taken in Co. Donegal. The following beetles seem to be worth recording from their occurrence on the summit:—*Cychnus rostratus*, *Nebria Gyllenhali*, and *Calathus nubigena*, all fairly common under stones (the specimens of the last-mentioned were not nearly so dark as some collected on Lugnaquilla, Co. Wicklow); *Bradycellus cognatus*, *Trechus obtusus*, *Homalota circellaris*, a dark variety; *Quedius boops*, *Othius myrmecophilus*, *Stenus lustrator*, a single specimen, new to the Irish list; *Lathrobium fulvipenne*, *Olophrum piceum*, *Arpedium brachyp-terum*, under stones on the wet peat; *Silpha opaca*, *Byrrhus pilula* and *Corymbites cupreus*. On the heather-clad slopes over the Minawn cliffs, the rare *Cymindis vaporariorum* occurs, but it is extremely difficult to capture amongst the long heath; it has

only once before been taken in Ireland. Many of the species occurring on Slievemore were also to be found here.

The lakes seem to be extremely poor in insect life, and this at a time of the year when water-beetles should be fairly plentiful. I have noticed the same characteristic, however, in connection with all the West of Ireland lakes that I have had opportunities of testing, and this is specially noticeable when these are isolated. The only species of interest met with was *Hydroporus obscurus*. The rare *Dytiscus lapponicus* may be expected to occur in some mountain tarn, but it has not been heard of in Ireland since its discovery many years ago in Donegal.

There is some very good collecting-ground in the north-east of the island. On the coast near Struhill Lough, a large piece of brackish water communicating with the sea, I noticed an abundance of insect life. Here under decaying seaweed just above tide-mark, the following more or less maritime species are to be found:—*Amara fulva*, *Dichirotrichus pubescens*, *Octhebius bicolon*, *Alcochara grisea*, *A. mæsta*, *A. obscurella*, and several species of *Homalota*, including two *H. halobrectha* and *H. princeps*, not previously known as Irish; *Philonthus intermedius*, *P. proximus*, *P. cbeninus*, and *Bledius arenarius*. So far as I am aware, the three following species of rove-beetle are now recorded as Irish for the first time:—*Xenusa sulcata*, *Bledius longulus*, and *Oxytelus maritimus*, the first was rare, but the other two were not uncommon in suitable places, even on the sand-bank facing the romantic little Keem Bay at the western end of the island. To a southern collector the following should be prizes:—*Carabus clathratus*, *Otiorrhynchus blandus*, and *Sitones lineellus*, all to be met with along the sea-coast. In the vicinity of Dugort some local species are occasionally to be found under stones on the tops of the low walls, such as *Carabus clathratus*, *Cychrus rostratus*, *Calathus nubigena*, *Amara spinipes*, and an interesting form of *Silpha subrotundata* approaching the English type *S. atrata* more closely than any examples I had previously taken in Ireland.

J. N. HALBERT.

MARINE MOLLUSCA.

THE strands of Achill Island, of which there are several, are not ideal places for shell-collecting. The Atlantic waves smash every shell into pieces, and generally only finely comminuted fragments are to be seen. Towards the eastern portion of the island, where there is more shelter, shells are to be found, and it is possible that dredging in these quieter waters might yield good results; but during our stay high winds rendered dredging impracticable. At the eastern end of the picturesque sandy bay adjoining Lough Nambrack, on the northern coast of Achill, shells had been washed in in some numbers, particularly at the rocky point on which stands an ancient monument marked "caher" on the 1-inch Ordnance Survey map. We paid two visits to this place, and brought away a bag of the finer material, with the results which appear in the subjoined list. Our warm thanks are due to Dr. Chaster, of Southport, for his kindness and promptness in determining a number of the smaller forms.

The list contains nothing of special interest, but as no list of Achill shells has apparently appeared hitherto, we think it worth while giving a complete enumeration of the species observed, as a contribution to the west coast fauna; the list fits in between Mr. Standen's list of Roundstone shells (*Irish Naturalist*, September, 1895) and Miss Warren's Killala list (*Journal of Conchology*, vol. vii., October, 1892)—Roundstone lying fifty miles south, as the crow flies, Killala forty miles north-east.

Our list runs to exactly 100 species and varieties, none of which call for special remark. Ten of them are not in Miss Warren's list, which was the result of some years' collecting; while over thirty are additions to Mr. Standen's more hurriedly compiled Roundstone catalogue. *Adcorbis subcarinatus* and *Venerupis Irus* are characteristic west coast southern species. *Pleurotoma septangularis*, frequent in our material, has not apparently been previously recorded from Connaught, and is a rare shell. Some shells, usually common on sandy beaches, appeared quite absent from Achill, such as *Cyprina* and *Lutraria*, *Fusus antiquus*, &c.

LIST OF SPECIES.

- Anomia ephippium*, L.
patelliformis, L.
var. *striata*.
Ostrea edulis, L.
Pecten Pusio, L.
var. *varius*, L.
opercularis, L.
Mytilus edulis, L.
modiolus, L.
Modiolaria marmorata,
Forbes.
discors L.
Nucula nucleus, L.
Arca tetragona, Poli.
Montacuta bidentata,
Mont.
Lasæa rubra, Mont.
Kellia suborbicularis,
Mont.
Lucina borealis, L.
Cyamium minutum,
Fabr.
Cardium echinatum, L.
exiguum, Gmel.
edule, L.
norvegicum,
Speng.
Astarte triangularis,
Mont.
Venus exoleta, L.
linctæ, Pult.
fasciata, Da C.
Casina, L.
ovata, Penn.
gallina, L.
Tapes virgineus, L.
pullastra, Mont.
var. *perforans*.
Tellina balthica, L.
tenuis, Da C.
pusilla, Phil.
Donax vittatus, Da C.
Mastra solida, L.
Solen ensis, L.
Mya truncata, L.
Saxicava rugosa, L.
Venerupis Irus, L.
Patella vulgata, L.
Helcion pellucidum, L.
var. *lævis*.
Tectura virginica,
Muller.
Emarginula fissura, L.
Fissurella græca, L.
Trochus tumidus,
Mont.
cincereus, L.
umbilicatus,
Mont.
lineatus, Da C.
zizyphinus, L.
Phasianella pulla, L.
Lacuna crassior, Mont.
divaricata, Fabr.
puteolus, Turt.
pallidula, Da C.
Littorina obtusata, L.
neritoides, L.
rudis, Maton.
litorea, L.
Rissoa striatula, Mont.
punctura, Mont.
costata, Adams.
parva, Da C.
var. *interrupta*.
violacea, Desm.
striata, Adams.
semistriata, Mont.
cingillus, Mont.
Barleeia rubra, Mont.
Skenca planorbis, Fabr.
Turritella terebra, L.
Scalaria communis, Lam.
Odostomia rissoides,
Hanley.
unidentata,
Mont.
turrita,
Hanley.
interstincta,
Mont.
Eulima polita, L.
Natica catena, Da C.
Alderæ, Forbes.
Adorbis subcarinatus,
Mont.
Aporrhais pes-pelecani, L.
Cerithium reticulatum,
Da C.
perversum, L.
Cerithiopsis tubercularis,
Mont.
Purpura lapillus, L.
Buccinum undatum, L.
Nassa reticulata, L.
incrassata, Strom.
Defrancia linearis,
Mont.
purpurea,
Mont.
Pleurotoma costata, Don.
nebula, Mont.
septangularis,
Mont.
turricula,
Mont.
Marginella lævis, Don.
Cypræa europæa, Mont.
Utriculus truncatulus,
Brug.
Actæon tornatilis, L.

FLOWERING PLANTS, &C.

ACHILL, at Easter, is a barren wilderness so far as the higher forms of vegetation are concerned. The bleak moors, storm-swept shores and mountain-sides, are alike almost devoid of spring vegetation so early in the year. A bank of Gorse here and there, the yellow stars of the Colt's-foot by the shore, the Marsh Violet and Dog Violet peeping from the bog-banks, and the Mediterranean Heath in full flower on the bogs over by Lough Nambrack, were almost the only blossoms that we saw. I noted altogether about 120 species, but the more interesting of these have mostly been already recorded from Achill. On the sandy wastes by the shore, *Draba verna* and *Saxifraga tridactylites*, both exceedingly minute, were in bloom. *Ranunculus Lenormandi*, which is abundant everywhere, and replaces *R. hederaceus*, may be also added to the list of spring flowers. The quartzite cliffs along by the Cathedral Rocks were draped with *Asplenium marinum* and *Saxifraga umbrosa*; the latter is found in every possible situation all over the island. The high undulating moors that stretch behind the huge precipices of Minawn are clothed with a close carpet formed largely of the Bear-berry and the Cow-berry—a lovely sight—with here and there a stunted Juniper. The only lake-plant seen was the common Shore-weed, *Littorella*. Trees there are none, and the tallest shrubs—the Bog-myrtle and a small Willow, probably *S. repens*—were only a couple of feet high. The cliffs of Slievemore yielded *Saxifraga stellaris* and *Sedum Rhodiola* in plenty, and *Vaccinium Vitis-Idæa* was observed near the summit. *Hymenophyllum tunbridgense* grew in several places about Slievemore, and the abundance of its ally, *H. Wilsoni*, was quite remarkable. On the seaward (northern) face of the mountain it forms a constant component of the turf which covers the slope, growing among the short Heather and *Sphagnum* quite unprotected or unshaded, and filling the deep crevices of the rocks with a luxuriant pale-green carpet. *Lastrea æmula* is common on the island, growing chiefly on roadside banks, and *Osmunda* was several times observed in similar situations.

The botany of Achill has not yet been thoroughly explored. Indeed, the mountain flora alone appears to have received

attention.¹ And while the flora of the island is certainly limited and poor, it appeared to me that at the proper season interesting results might follow an examination of the numerous low-level lakes, some of them brackish, and the boggy or sandy swamps by which they are surrounded.

R. LLOYD PRAEGER.

National Library, Dublin.

SEA-WEEDS.

THE fact that Achill is justly famed for the boldness and beauty of its coast scenery might lead one to expect the existence of a luxuriant marine flora, but this was not found to be generally true.

The weather during the first three days of our visit was unfavourable for shore work, and dredging was altogether out of the question. The first day was spent in collecting on the western side of Keel strand opposite the village, but a spring tide flowing caused most of the forms collected to be of the nature of drifted specimens, and on that account they lost some of their interest; but judging from the species noticed, I have no doubt a number of interesting forms occur below low-water mark.

Keem Cove, visited on April 9th, was even more disappointing; here the cliffs are steep and rugged, and the principal sea-weeds noticed were *Chondrus crispus*, *Dumontia filiformis*, *Chorda filum*, and *Pelvetia canaliculata*.

On the north side of the island, two miles north-east of Doogort, better collecting-ground existed in the form of rock-pools, in some of which the well known Purple Sea-urchin, *Strongylocentrotus lividus*, common to the west coast of Ireland, was found burrowing into the hard rock. Lamina-rians and the following forms were here growing luxuriantly—*Halidrys siliquosa*, *Phyllitis fascia*, *Scytosiphon lomentarius*, *Alaria esculenta*, *Dumontia*, *Laurencia* sp., *Halurus equisetifolia*, *Furcellaria fastigiata*. The following day, Tuesday, was the first calm day, and taking advantage of it, I tried some dredging along the coast for a mile west from Doogort village.

¹ Hart: Report on the Flora of the Mountains of Mayo and Galway, *Proc. R.I.A.*, 2nd s., vol. iii., No. 10, 1883.

Here some fine *Laminaria* banks were found at the extreme end of Doogort strand; the locality is well sheltered from the south winds, but the only boat available for this work was a coracle, and the experiment turned out to be more exciting than successful. Nevertheless, some forms not previously found were dredged, the following being noticeable in the hauls taken:—*Callophyllis laciniata*, *Delesseria sinuosa*, *D. alata*, *D. sanguinea*, *Griffithsia corallina*, *Lomentaria articulata*, *L. clavellosa*, *Nitophyllum laceratum*.

April 14th was spent collecting towards Ridge Point, and on the eastern side of the island in the direction of the Sound. From the low-lying nature of the coast, a richer littoral flora obtains here than in any other part of the island. I venture to suggest that marine naturalists visiting the island in future, for the first time, would find this locality to be more productive of good results than any other.

HENRY HANNA.

Royal College of Science, Dublin.

PROCEEDINGS OF IRISH SOCIETIES.

ROYAL ZOOLOGICAL SOCIETY.

Recent gifts include an opossum from Mrs. Talbot Power, a Himalayan Bear from the officers of the 17th Lancers, a Roseate Cockatoo from Lady H. Blackwood, a Muscovy Duck from Mr. S. R. Maunsell, a pair of Canadian Geese from Mr. W. P. Robinson, a Pine Marten from the Marquis of Waterford, and six Green Tree-frogs from Mrs. J. E. Kenny.

At the meeting on April 30th the Council passed a resolution expressing their deep regret at the death of the late President of the Society, Dr. S. Gordon, their sense of his inestimable services to the Society during the long period he served on the Council, and their sincere sympathy with his family in their heavy bereavement.

10,600 persons visited the Gardens in April.

BELFAST NATURALISTS' FIELD CLUB.

MARCH 15.—WM. GRAY, M.R.I.A., lectured on "The Anthropological importance of the antiquarian remains in Antrim and Down." The lecture was fully illustrated by lantern slides.

APRIL 19.—The Thirty-fifth Annual Meeting was held. WM. GRAY, M.R.I.A., in the Chair. The Report for the past year was read and showed that the Club had been steadily and successfully carrying out its objects. The Treasurer's Report stated that there was a small

balance on the wrong side owing to a number of subscriptions for the past year being still unpaid. The election of Officers for the coming year was proceeded with, as follows:—President, Rev. C. H. WADDELL, B.D.; Vice-President, FRANCIS JOSEPH BIGGER; Treasurer, W. H. PHILLIPS; Librarian, WM. SWANSTON; Committee—L. M. Bell, W. J. Fennell, W. Gray, John Hamilton, F. W. Lockwood, S. A. Stewart, Miss S. M. Thompson, John Vinycomb, R. Welch, Joseph Wright; Hon. Secs., JAMES ST. J. PHILLIPS and W. D. DONNAN, M.D.

The prize for the best collection of fossil sponges was awarded to R. Bell. Suggestions were received for Summer Excursions, and a list of places sent forward to the Committee to select from.

After the business part of the Meeting, "A Note on Foraminifera from Irish Carboniferous Rocks," by Fred. Chapman, F.R.M.S., was read, dealing with the renaming of specimens found in 1849, by M'Coy, and named *Nodosaria fusiliniiformis* (M'Coy). Recent research shows the specimen should be named *Daccamina fusiliniiformis*.

The loan collection of slides from the British Association Committee on Geological Photographs was then exhibited as illustrative of the origin of landscape. The parts played by deposition, deformation, and denudation were successively pointed out in the formation of the framework on which the "variable constants" of atmosphere, sunshine and shadow, plant life and vegetation built up their effects.

GEOLOGICAL SECTION.—At the meeting held on 28th April, a presentation of a fossil Nautilus mounted as an inkstand was made to Miss S. M. Thompson, by the members of the Section. In making the presentation, the Chairman (W. J. Fennell) said it was as a slight recognition of the constant service and valuable help rendered as Secretary of the Section for four years that the presentation was made. Afterwards a number of micro-slides illustrating optical figures by convergent polarized light were shown by Jas. St. J. Phillips.

DUBLIN NATURALISTS' FIELD CLUB.

APRIL 19.—The President, R. L. PRAEGER, B.A., B.E., in the chair. Mr. G. P. FARRAN read a paper entitled:—"Snails and Slugs: their structure and habits." The paper was illustrated by living specimens, lantern slides and diagrams. The President, Mr. Hanna, M.A., Dr. Alcock, and Mr. Palmer spoke on the paper. Dr. T. JOHNSON exhibited a set of coloured botanical diagrams presented to the Botanical Collections of the Science and Art Museum. Mr. HANNA showed a number of seaweeds collected during Easter at Achill. The Rev. MAXWELL CLOSE, F.G.S., Treasurer of the Royal Irish Academy, proposed, and Mr. J. C. ROBERTSON seconded the following resolution, which was unanimously adopted:—

"Having regard to the unanimous Report of the Government Committee of inquiry that a new building is necessary for the work of the Royal College of Science for Ireland, this Club, deeply interested in natural history study, and conscious of the unfavourable position natural

science occupies in the educational system of Ireland, urges on the Government the necessity of acting, without delay, on the Report."

Mr. Close in proposing the resolution said that he had no hesitation in asking the Club to adopt it. All knew the good being done by the College, the use it was to the Field Club and its work, and the inadequacy of the College buildings. He thought the present buildings should be swept entirely away. The justice of the claim was not lessened by the fact that the Government had agreed to spend nearly a million pounds on Science and Art buildings in London. Let this Club join its voice to the general chorus beseeching the Government to carry out this necessary object. Mr. and Mrs. F. A. Gibbon and Mr. Hanna were elected members of the Club, and one nomination was made.

APRIL, 23.—A party of members and their friends visited Kildare, and in spite of the unfavourable weather, enjoyed an examination of the Chair of Kildare, the geological features of which, as well as of the surrounding district, were described by the conductor, Mr. Henry J. Seymour, B.A., an Honorary Secretary of the Club. Several other members, including Dr. Foord, F.G.S., and Mr. A. Shackleton, also spoke on features of interest in the district. Tea was taken at Talbot's Hotel, and at a business meeting, with Mr. J. F. Palmer, Vice-President, in the chair, Prof. A. F. Birmingham, M.D., was elected a member.

CORK NATURALIST'S FIELD CLUB.

APRIL, 21.—The annual general meeting was held in the Library of the School of Art. Mr. J. L. COPEMAN (President), occupied the chair.

The Hon. Secretary read the minutes of the previous meetings, which were confirmed, and then presented the sixth annual report as follows—Your committee are pleased to report a further increase of members during the past year—the membership now making a total of 71—including 7 honorary members, as against a total of 63 for previous year. Seven members have resigned during the year, and fourteen new members have joined, thus making the nett gain 7. Your Club has gained a valuable addition to its hon. membership in the Misses Delap—who have presented some splendid specimens of jelly-fish to the Club, and have promised from time to time to send other specimens. Another hon. member, Mr. J. Griffin, Queen's College, is preparing some botanical specimens for presentation to the Club. These should prove of great use to members, and your committee hope that other members may be induced to follow these excellent examples. The following eight excursions were arranged during the year, only one of which fell through:—May 8—Fota, which was well attended. May 26—Castletownroche, including Castle Widenham, and the valley of the Awbeg. As the result of this excursion the Dog's Mercury (*Mercurialis perennis*), a plant new to Cork, was discovered by Mr. R. A. Phillips. Mr. Phillips identified on this excursion the following rare plants—*Arabis hirsuta* (Hairy Rock Cress), *Sisymbrium Alliaria* (Hedge Mustard), *Barbarea præcox* (Early Winter Cress), *Trifolium incarnatum*, *T. medium* (Zigzag Clover), *Tragopogon pratensis* (Yellow Goat's-beard), *Linaria minor* (Least Toad-flax), *Scirpus*

sylvaticus (Wood Club-rush). June 12—Little Island—A most enjoyable geological and botanical excursion attended by about 20 members. Some beautiful specimens of the Bee Orchis were found, also *Lepidium Draba*—an alien, but very rare—and *Valerianella dentata*. July 17—Inchigeela—This excursion fell through, owing to not sufficient number of members attending. July 21—Blarney Junction—A most enjoyable outing. Nothing new was added to the flora of the county, but many new plants were added to members' own collections. July 28—Mourne Abbey to Mallow. The attendance was small. August 12—Youghal—the excursion of the year. The committee decided to give a book, value 6s., to the member who collected the greatest number of botanical specimens. The competition was very keen. Mr. R. A. Phillips acted as judge. Mrs. Brooke-Hughes was the prize-winner, with a collection of 101 species. September 11—Ballinhassig Glen—The last outing of the Club. Many different kinds of mosses were found, but the members searched in vain for the Filmy Fern, reported from this station; it remained hidden and refused to discover itself. November 26—A lecture was given by Mr. J. L. Copeman on "Transformations of Insects," illustrated by upwards of 40 large drawings. The lecture proved most instructive and interesting, and was well attended. January 24—A most valuable lecture was given by Prof. M. Hartog, D.Sc., on "Some Moss-Dwellers." The attendance was good. Your committee hope that both these lectures have paved the way, and will lead to greater interest being taken by members in entomology. February 22—A lecture under the joint auspices of the Literary and Scientific and Cork Naturalists' Field Club was delivered in the Ballroom of the Imperial Hotel, by Professor Johnson, D.Sc., on "Irish Seaweeds," illustrated with specimens, diagrams, lantern slides, and microscopic preparations. There was a good attendance, and great interest was shown in the demonstrations by Professor Johnson of different methods of mounting seaweeds. April 4—Mr. J. Porter, B.E., delivered a lecture, illustrated by limelight views, entitled "River Valleys," which proved most interesting. The attendance was large. Your committee are very glad to find so many more members taking up systematic study of the different branches of natural history. In botany, Mr. Phillips, as usual, leads. He has added *Enanthe pimpinelloides* to the flora of Ireland, and the following plants to the flora of the County Cork—*Alyssum calycinum*, *Barbarea intermedia*, *Barbarea stricta*, *Rubus Sprengelii*, *Rubus oigoclados*, *R. iricus*, *R. Balfourianus*, *Hieracium umbellatum*, *Thymus Chamædrys*, *Potamogeton lucens*, *Sparganium neglectum*, *Poa nemoralis*. Mr. J. J. Noonan collected *Teucrium Chamædrys*, a species of Germander recorded for the same locality many years ago, but which was supposed to have become extinct. The Lesser Broomrape was also found near Youghal. In entomology, several specimens of the Clouded Yellow butterfly (*Colias edusa*) were taken by Mr. W. H. Johnson and by Mr. J. J. Wolfe, Skibbereen. This species is of very uncertain occurrence in Ireland. In geology, some fine fossils were found at Little Island in the limestone, and other fossils in the slate quarries at Ballinhassig. Your committee have, in accordance with a motion passed by

them at a meeting last year, expended some of the accumulated money of the Club in forming the nucleus of a reference library. The following books have been bought:—Hooker's "Flora of the British Islands," Praeger's "Open-air Studies in Botany," Pratt's "Ferns of Great Britain," Adams's "Land and Fresh-water Shells." It is suggested to add to these books from time to time as the need occurs. The members can borrow them on application to Hon. Secretary, who will lend the books (subject to regulations) in order of application received. Some members have kindly promised to lend books. Their names and the names of the works they are willing to lend will be made known in due time. Another suggestion made at last general meeting was that juniors be allowed to join the Club by paying a subscription of 2s. 6d. So far that has not met with success, only one junior at present belonging to the Club. The balance sheet to be submitted to you is, considering the lectures and reference library, in all ways satisfactory. In conclusion, your committee hope that from the facilities they have given to members for study in the various branches of natural science, the Club may take a fresh lease of life, and in the near future be looked upon as the premier field club in Ireland.

The President said the report was a very satisfactory one, as they had been enabled to give a few details of work which previous reports lacked somewhat. Their record for the past year showed that the members had manifested more interest, and speaking generally the Club was in a very healthy condition.

On the proposition of Mr. Franklin seconded by Mr. Phillips, the report was adopted unanimously.

The next business was the election of President for the coming year.

Mr. Phillips proposed the re-election of Mr. Copeman as President, Mr. Noonan seconded the motion, which was passed.

Mr. Phillips proposed and Mr. Franklin seconded, and it was agreed, that Professor Hartog (*ex-officio*), Mr. W. H. Shaw (*ex-officio*), Mr. T. Farrington, M.A.; Miss Martin, F.S.A.; Mr. J. H. Bennett, and Mr. H. Lund, be Vice-Presidents.

On the proposition of Mr. Lacy, seconded by Mr. Phillips, Mr. W. H. Johnson was elected Hon. Secretary and Treasurer, *vice* Mr. E. B. Hughes, who was unable to accept re-election.

Mr. R. A. Phillips was re-elected Hon. Curator.

The committee was appointed as follows—Mrs. Russell, Mrs. Hughes, Mr. F. R. Rohu, Mr. E. B. Hughes, and Mr. J. Noonan.

On the motion of Mr. Lacy, seconded by Mr. Phillips, a hearty vote of thanks was passed to Mr. Hughes, for the valuable services rendered by him to the Club during his year of Secretaryship.

A discussion having taken place as to the excursions for the coming session, the meeting ended.

NOTES.

BOTANY.

PHANEROGAMS.

Saxifraga umbrosa in Queen's County.

During a cycling excursion I observed a fine specimen of London Pride (*Saxifraga umbrosa*) growing wild on top of a wall near Lacka Church. I was walking up a steep hill at the time when my brother and I observed it there. Hitherto this plant has not been found outside Cork or Kerry and the South-west in a wild state. This adds another rare plant to the flora of Queen's County.

R. M. MILLER.

Roscrea.

[Reports of *Saxifraga umbrosa* from various parts of Ireland have been made at intervals. The plant is a free grower, and often spreads rapidly where introduced. For instance, it fills the Glen of Altadore in Co. Wicklow, and a wood at Rockport on the shore of Belfast Lough. But its distribution shows that it is not a native in these localities. The present station—the top of a wall—bears the stamp of introduction on the face of it. The range of the wild plant has been well worked out—the south and west coast of Ireland, from Waterford to Donegal. The addition of the London Pride to the flora of Queen's Co. would be of the highest interest; but this cannot be effected by the discovery of one plant on a wall-top.—EDS.]

Saxifraga tridactylites, Linn. in Cos. Down and Antrim.

The only known station for this Saxifrage in Co. Antrim was old walls about Lisburn, where, according to Templeton, it was common in 1800. In *Fl. N. E. I.* it is noted as “still found sparingly on these old walls.” Mr. Stewart informed me that it was last seen there, in one place only, about twenty years ago. I have several times examined the spot which he indicated, but the wall on which it grew has been plastered over, and the Saxifrage no longer exists there. It is, however, satisfactory to state that it is not extinct in the county, inasmuch as I have lately met with it on a low wall by the weir near “The Island” on the Co. Antrim side of the Lagan. It is there in such profusion that, in early April, its young foliage gave a conspicuously reddish hue to the top of the wall, which, later in the same month, became quite white with the abundant exquisite little flowers.

The species also occurs, in almost equal abundance, on a wall of the eleventh lock of the Lagan Canal, about half a mile below Lisburn. This locality is in County Down.

J. H. DAVIES.

Lisburn.

Neotinea intacta in County Galway.

I found *Neotinea intacta* growing in the County Galway, May 8th, 1898, about two miles E. of Kinvarra (to the S. side of Kinvarra—Ardrahan road), four miles W. of Ardrahan station, and about four miles S.W. of the "Hunting Course," Castle Taylor, where in 1864 Miss F. M. More, when out botanizing with her brother, Mr. A. G. More, discovered it. I also found it about three miles E. of Kinvarra (to the N. side of the Kinvarra-Ardrahan road), five miles N.W. of Ardrahan, and about three from the "Hunting Course," Castle Taylor. It was growing plentifully in both localities together with *Gentiana verna* and *Gnaphalium dioicum*. It was only just in flower, while the Gentian has been out since the beginning of April, and *Orchis Morio*, of which there is quantities in this part of Galway, is nearly over.

MARGARET E. JOYCE.

Craughwell.

ZOOLOGY.

INSECTS.

Coleoptera from Valentia Island.

During the past winter and early spring, Miss M. J. Delap has been good enough to send to the Dublin Museum several small collections of beetles from Valentia. Amongst these were examples of three species that have not been previously recorded from Ireland. They are *Phlaeocaris subtilissima*, Mannh., found in rotten Fuchsia sticks and in moss; *Oligota punctulata*, Heer, and *Lesteva pubescens*. The *Phlaeocaris* occurs as far north as the Moray district in Britain. The *Oligota* is a rare species, but I have met with it amongst shingle in the bed of the Dodder, Co. Dublin. The following beetles are also worth recording from so remote a locality:—*Leistus fulvibarbis*, *Anchomenus fuliginosus*, *Acupalpis exiguus*, var. *luridus*, *Aleochara mastia*, *Homalota luridipennis*, *H. orbata*, *Tachyporus nitidicollis*, *Philonthus cephalotes*, *P. intermedius*, *P. proximus*, *Stenus ossium*, *S. paganus*, *Haploderus calatus*, *Lathrobium boreale*, *Cryptophagus saginatus*, *Myceteca hirta* in moss, abundant, *Olibrus bicolor*, F., one specimen, *Ptinus fur*, *Otiorrhynchus blandus*, *Apion miniatum*. On Beginish Island *Calathus nubigena*, *Quedius semiceneus*, *Philonthus sanguinolentus*, and a fine series of *Omalium laeviusculum*, Gyll., a new record for the south-west.

J. N. HALBERT.

Science and Art Museum, Dublin.

Early Pararge megaera in Co. Tipperary.

Is not March 20th phenomenally early to see this butterfly on the wing? On that day during service in Thurles Church, I observed one flitting about, and several others on the sunny side of the road when returning homewards, about three miles south of Thurles. Is it possible they could have emerged so early, or were they merely hibernated specimens? Newman gives May as their earliest appearance.

J. H. JOHNSTON.

Athlomen, Thurles.

MOLLUSCS.

Hydrobia Jenkinsi, Smith, In Co. Donegal

It is interesting so soon after its first record in Ireland (*Irish Naturalist*, September, 1897), to find this brackish-water shell turning up at several new stations, Mr. J. N. Milne of Culmore, having recently collected it in large quantities in the Foyle at St. Johnstone, and Carrigans, Co. Donegal, an addition to the County fauna and to district XII. At Carrigans he found several large patches of living and dead shells collected together, one of these six yards long, one yard wide, and one to two inches deep. He states there must have been millions, mainly dead shells, in this lot. Of 800 specimens counted out, only 5 per cent. were carinated, while at St. Johnstone further up the river all the shells were typical, showing no keel. Within the last few days he has also found it alive in a slightly brackish pool close to Culmore Station, on the Co. Derry side of the Foyle, where over fifty per cent. are the variety, but many of these are distinctly coronated rather than carinated, the crown of spines having a tendency to run into a fine keel in the final whorl. The Culmore shells are also much larger than those in Bann or Foyle; they measure 5 by 4 mm., while the latter average only 3.75 by 1.9 m.m. Mr. Milne is quite certain that the species did not live there two years ago.

R. WELCH.

Belfast.

Helix limbata, Drap., a Pyrenean Shell Introduced at Belfast.

This interesting tourist from the South of Europe was discovered last summer by Master Arthur Stelfox feeding on a roadside at Belmont, Co. Down, near Belfast, close to Dickson's nursery. He only obtained one specimen about two-thirds grown, which I forwarded to Dr. Scharff, who immediately recognised it as an old friend which does not range further north in Europe than the Loire, inhabiting the country north and south of the Pyrenees—in France and Spain.

As the shell was doubtless introduced with plants to the nursery, I hunted for it very carefully lately, on chance there might be a small colony there, but found no further trace of it; Mr. Hugh Dickson informs me that he imports many plants from Southern French nurseries, such as *Arbutus Unedo*, *Andromeda floribunda*, *Genista andrena*, *Kalmia latifolia*, *Azalea mollis*, and *A. indica*, with Camellias and Magnolias, and as many of these have large balls of earth round their roots it would be easy for shells to come with them, possibly in the egg state. This shell is translucent, white, with one opaque white band. When full grown it would be 12 to 15 m.m. (about $\frac{1}{2}$ inch) broad—rather larger than a good-sized *Helix rufescens*.

R. WELCH.

Belfast.

BIRDS.

Spring Migrants in Co. Wexford.

The following are the dates of the first appearance of our migrants at Ballyhyland, so far as observed, this spring:—Chiffchaff, April 6; Swallow, April 8; Willow-wren, April 12; House-Martin, April 16; Cuckoo and Corncrake, April 20; Grasshopper-Warbler, April 24; Swift, April 26; Sedge-Warbler, May 4; Whitethroat, May 6; Nightjar, May 9; Spotted Flycatcher, May 10. For the date of Cuckoo and Corncrake, I am indebted to an informant who heard these birds before I did, the Corncrake when first heard being in very feeble voice. Perhaps the apparent lateness of most of the Warblers may be a consequence of the harsh spring weather, which not improbably deterred them from announcing their presence so soon after reaching us as they generally do. The bird longest behind his time was the Chiffchaff, whose average date for the previous seven years (1891-97) is March 23rd. The Swallow, Martin and Swift have come rather early. A "Cuckoo" was reported here, as in many other localities, long before the time at which the arrival of this species is credible.

C. B. MOFFAT

Ballyhyland, Co. Wexford.

The Grasshopper Warbler.

According to Mr. A. G. More's List of Irish Birds, the Grasshopper Warbler (*Acrocephalus neuwiedii*) is rare, especially in the West of Ireland, though mentioned as having been found in Mayo in 1866. A few days ago when I was out riding I heard its note on Ballydugan Hill, Loughrea. The bird is unmistakable by its note, which sounds exactly like the winding up of a fishing-reel, and by which I recognized it ten years ago in some scrub about four miles S.W. of Athenry, since which time, till this year, I have never heard it in Galway, although I have often listened for it.

MARGARET E. JOYCE.

Craughwell.

The Stock Dove in Queen's County.

On 20th April while cycling in the neighbourhood of Kinnity, I was informed on good authority by the gamekeeper at Castle Barnard (Mr. Rutherford) that the Stock Dove (*Columba oenas*) is breeding there this season. As it has been already observed in various parts of Queen's County and also in a few other localities in Ireland, and has now been traced to the western part of the county, it is to be hoped that before long it may be observed nesting in some of the adjoining counties.

R. M. MILLER.

Roscrea,

Little Bittern In Wexford.

I am informed by my friend Mr. E. A. Gibbon, that a specimen of the Little Bittern (*Botaurus stellaris*) was recently brought to Wheeloche's of Wexford, by a farmer who lives near Taghmon, in which district it was killed sometime in 1897. It was seen by Mr. E. A. Gibbon, but all our efforts to find out something more about its history have been fruitless, owing to the wish of the owner of the bird to remain unknown.

G. E. H. BARRETT-HAMILTON.

Kilmanock, New Ross.

Ferruginous Duck and Buzzard in Ireland.

In view of the record in the *Zoologist* for January, 1898, of an occurrence of the Ferruginous Duck (*Fuligula nyroca*) in Ireland, it is of interest to note that another specimen is stated to have been shot recently at Baronston, in Co. Westmeath, where it is now preserved. A note of the occurrence of this rare duck, together with that of a Buzzard at Baronston, were sent by Mrs. F. J. Battersby to "*Knowledge*," and she informs me that the Editor of that journal alluded to her note in the issue of January, 1898. I have not seen the issue of "*Knowledge*" referred to, and as I suspect that not all Irish naturalists have access to that journal, I send this note with Mrs. Battersby's permission. The Buzzard, as I am informed by Mrs. Battersby, is in the hands of Messrs. Williams & Sons, of Dublin, for preservation. It is stated to have "just killed a fine cock pheasant" before it was shot. No doubt full details of the capture of both birds could be obtained by application to Colonel Malone, the owner of Baronston.

G. E. H. BARRETT-HAMILTON.

Kilmanock, New Ross.

MAMMALS.

The Mice of the North Bull, Dublin Bay.

In the *Journal of the Linnean Society* (*Zoology*, vol. xxvi., pp. 465-473, pl. 30), Mr. H. L. Jameson gives a valuable account of the colony of the House Mouse (*Mus musculus*) which inhabits the sandhills of the North Bull. The great majority of these mice are rufous grey above and pale buff beneath, harmonising remarkably with the colour of the dry grasses among which they live. There is a perfect gradation to these pale individuals from the ordinary dark type of the species. This fact taken in conjunction with the nature of the enemies of the mice which frequent the sandhills—hawks, and owls hunting by sight—has led Mr. Jameson to conclude that he has discovered a variety or sub-species in process of differentiation by means of natural selection. From old maps and records it appears that the North Bull first appeared above the water about a century ago, and has gradually increased in size during the present century. A time-limit is thus given for the development of this remarkable race of mice

OBITUARY.

SAMUEL GORDON, M.D.

We regret to record the death of one of the oldest of Dublin naturalists, Dr. Samuel Gordon, who passed away on April 29th, at the ripe age of 82 years. A hard-working medical man, associated with several of the Dublin hospitals, and at one time President of the College of Physicians, Dr. Gordon was much interested in natural history. He was a member of the now extinct Dublin Natural History Society, and served for many years on the Council of the Royal Zoological Society of Ireland, the Presidency of which he held from 1893 until the end of last year.

JOHN SHEARSON HYLAND, PH.D., F.G.S.

Many Dublin naturalists who recall the presence of Dr. Hyland on the staff of the Irish Geological Survey from 1888 until 1891, during which time he carried out some valuable petrological work, will be grieved to learn that he succumbed to an attack of fever at Elmina, West Africa, on April 19th, at the early age of 32. A native of Liverpool, Hyland studied at University College in that city, and later at Leipzig, under the famous Zirkel, taking his doctor's degree in 1888 with a thesis on the rocks of Kilimanjaro. After his too brief service in Dublin, he turned to mine-prospecting, and the last seven years of his life were passed in North America and tropical Africa, investigating the geology and mineral resources of new regions.

C. HERBERT HURST, PH.D.

The death of Dr. C. Herbert Hurst on May 10th, 1898, at the early age of 42, cannot but be regarded as sad and untimely. More than once about Christmas time he expressed concern at the loss of blood consequent on the removal of a number of teeth. Blood-poisoning followed, and when influenza seized him, more than one who knew his weak state of health felt there was cause for alarm, which proved too well justified by the fatal result.

Dr. Hurst was born in Lancashire and received his early education, including a liberal amount of science, in the Manchester Grammar School. Later he went as a Science Teacher in Training to the Royal College of Science, London, where he worked under Frankland in chemistry, and later under Huxley in biology. He never forgot his obligations to these two men. On leaving London he was persuaded to take a post as Science Master in a boarding school in Yorkshire, where work was hard and discipline severe. Dr. Hurst modelled his lectures

on those of Frankland, and would allow nothing to interrupt his discourse, a characteristic the boys were not slow to discover. Though classics were not his strong point, he tried, in those days, to work out an improved system of the Latin declensions, but ultimately abandoned the attempt. After a lapse of nearly twenty years, he retained clear and pleasant recollections of many of the boys and their pranks. Leaving the school Hurst returned to the study of science, taking high honours in biology under Huxley. He was a skilful dissector and thorough draftsman. After studying for some time under the late Professor Milnes Marshall he went abroad to continue his zoological studies. As he more than once said, it was at Marshall's own request that he returned to become his assistant at the Owens College, Manchester. During this time the writer saw very little of him. One of his zoological friends says:—"For eleven years he filled this office with conspicuous diligence and success, and not only earned the grateful recollection of several generations of students of the College, but also laid under obligation a much wider circle of zoologists by his share in the production of the 'Text-book of Practical Zoology' which has made the names of Marshall and Hurst familiar in every biological laboratory not only in this country but in the world."

In 1889 he took the degree of Ph.D. in the University of Leipzig, his thesis being on the life-history of the guat. He published subsequently several papers on the anatomy and sense organs of insects. In the accidental death of his chief, Marshall, Hurst lost a good friend, and his disappointment was great when, after carrying on the work of the zoological department at Owens for the rest of the session, the vacant Chair was given to another. The promotion of Mr. Duerden to the Curatorship of the Institute of Jamaica created a vacancy in the biological staff in the Royal College of Science, Dublin, and consequent on certain much needed re-arrangement of the work, Prof. Haddon offered Hurst the demonstratorship of zoology with which an additional inducement, in the form of a zoology lectureship at the Ringsend Fishery School, was associated. Hurst expected in Dublin opportunity for research which his Manchester post had not sufficiently given; but, on his arrival, he devoted any spare time he had to a careful systematic arranging and labelling of specimens and microscopic and lantern slides, a laborious piece of perfectly voluntary work for which his only return could be the appreciation of his chief. He took very little part in field zoology, his memory, he used to say, not being suited to systematic work, but he was keenly interested in the discussion of zoological problems. With that sturdiness of character so marked in the people of the North of England he had, to a certain extent, the less amiable quality of outspokenness of opinion which is apt to offend the more sensitive southerner. Yet no one would give himself more trouble than he did to help a student,—time, knowledge, books, specimens were freely placed at anyone's disposal. His recent articles in *Natural Science* in which he began a "systematic criticism of biological theory" included such subjects as "The Nature of Heredity," "Evolution and Heredity," "The Recapitulation Theory" (a favourite subject with Milnes Marshall).

Hurst undertook an investigation of the characters of the well-known fossil bird *Archæopteryx*, believing the views generally held by zoologists as to the functions of its wing bones to be wrong. In connection with the subject, he visited Berlin to examine there one of the two known specimens of the bird.

May his memory, as an enthusiastic, painstaking teacher, a sincere friend, long stay with us!

T. J.

A SCIENTIFIC GUIDE-BOOK.

Official Guide to County Down and the Mourne Mountains ;

by ROBERT LLOYD PRAEGER, B.A., B.E., M.R.I.A., President of the Dublin Naturalists' Field Club. (Published by Marcus Ward & Co., Belfast, for the Belfast and County Down Railway Company, 1898. Pp. i.-ix. and 1-232 ; with maps and about 100 illustrations. Price 1s.)

It is not often that an official guide-book is written by a scientific observer ; still less often is a railway-guide devoted to making known the by-ways as well as the highways of the district served. Mr. Praeger has probably walked over more of the County of Down than any man of the same age ; and his intimacy with the solitudes of the Mournes makes it natural that he should be asked to undertake their description for the public. But his observation and research in all the wide region to the north, where cromlechs, and cairns, and relics of old keeps, abound, show that he can treat his subject equally from an antiquarian point of view ; while throughout, aided by the generous help of Dr. Joyce, he has kept before us the meaning of the old names—names full of natural suggestion, like Knockinelder, or rich in history, like Downpatrick.

We are so accustomed to the brief and often disparaging utterances of the guide-book writer, in regard to those who follow a scientific pursuit during their holidays, that it is refreshing to find an author to whom such pursuits seem natural in a natural man. The introduction to the County occupies 27 pages ; and of these, seven are devoted to history, two to archæology, eight—including several illustrations—to recreative sports, and seven, far more closely printed, to natural history and geology. The small type used for this purely scientific section, instead of proving a defect, enables it to be singularly full, and amply supplied with references. No one but a careful watcher of the *Proceedings* of the Belfast Naturalists' Field Club, and, indeed, no one but an original observer, would have given us the records of marine and fresh-water mollusca on p. 24, or would have suggested to the excursionist a search for *Otiorrhynchus auropunctatus* (p. 25). In the botanical passages, again, we find some characteristic hints as to the connexion of plant-distribution and geology.

Naturalists will turn to the last seventy pages, dealing with the Mourne district, for information as original as it is detailed. A general shaded map, in four colours, is given, on which all the summits are named, from Clonachullion Hill to Knockshee above the Carlingford inlet. The northern section of the group is further admirably dealt with in a reproduction of Prof. M. F. Fitzgerald's contoured map—the only one, we believe, as yet published; the reproduction is enhanced by the contour-lines being in red, while the rivers are printed in blue. Two sketches, on pp. 200 and 201, indicate the forms of the summits as seen respectively from Lisburn and Slieve Donard, and will aid in their recognition in the field.

The stress laid on the types of jointing in the granite (p. 203) will explain many of the more remarkable rock-features, which are otherwise apt to impress the tourist with a sense of the strange rather than the beautiful. He can now correlate the sheer grey walls, wearing the aspect of titanic masonry, or the great bare faces on Slieve Bernagh or Slieve Meel, with the planes of fracture that were set up in the granite as it slowly cooled and settled down.

And the natural architecture of the "Castles" on Slieve Commedagh, so nobly portrayed on p. 220, will in time remind the pedestrian less of the work of human hands, and more of the work of those world-wide forces, against which he also, in his own pleasure-taking, must contend.

The mention of the illustration of these pinnacles brings us to the pictures in general, which are liberal in number and admirable in reproduction. The majority are process-blocks, reduced from Mr. Welch's views; and the pure beauty of some of them, even in this form, is enough to send the artist or the antiquary to the originals. Take for instance, "Downpatrick from Gallows Hill" (p. 129); the picturesque backing to Kilbroney Cross (p. 187); and the sense of moorland desolation conveyed in the twelve square inches of the view up the unhappily named "Happy Valley" on p. 226. Notice, again, the use made of the commonplace neatness of Rostrevor on p. 186, by drawing up a solid-wheeled car across it, as a touch of primitive times.

Finally, this little book, bound with rounded corners for the pocket, will prove a pleasant companion among more ambitious volumes in a library. One need not even have visited the district to enjoy its multifarious details. The antiquary will find in it plans of ruins, coats of arms, corporate seals, and, in Mr. J. St. J. Phillips's restoration of Dundrum Castle, a touch of Viollet-le-Duc and Carcassonne. The scientist will know that its field-observations are reliable, and that its guidance in mountain-climbing is that of an expert in the Mournes. The credit for its production must not rest altogether with the author and the artists, but must be shared with the enterprising Railway Company, which has preferred to appeal, in this latest venture, to the higher spirit of the tourist.

GRENVILLE A. J. COLE.

Royal College of Science, Dublin.

NOTES ON MOSSES AND HEPATICÆ OF ULSTER.

BY REV. C. H. WADDELL, B.D.

I HAVE lately had the opportunity, through the kindness of Professor Johnson, of examining a volume in the National Museum containing a mounted collection of Mosses and Hepaticæ made in Co. Antrim by Dr. D. Moore during the years 1836-38. At that time he was only at the commencement of his studies in bryology; some of the names of the specimens were afterwards corrected by himself, and this will account, I think, for the presence of some errors still remaining. When compiling the *Flora of N.E. Ireland* Mr. Stewart tells me he was only able to give a hurried examination to the volume. As several plants of interest have been overlooked, and some errors in the naming been perpetuated, it will be well I think to put the following notes on record. In addition to these, I have added some new records and localities additional to our northern flora. New records for *counties* are marked with an asterisk. D.M. stands for Dr. Moore's collection above-mentioned, and C.H.W. for the plants found by me. For convenience I give the names as in the *Flora N.E. Ireland*.

Georgia Brownii (Dicks.), Muell.—The exact locality is "rare, in a small glen on the side of Glenmakerran, townland of Ballyvally, on mica slate, June, 1836," D.M.

Dicranum Scottii, Turner.—A plant from "wood at head of Glenariff, 1836," D.M., named at first *D. flagellare* and corrected to *Scottianum*, is only a straight-leaved form of *D. scoparium* (L.) Hedw.

***Pottia recta** (With.), Mitt.—On bare clay of tennis-ground by the sea, Fahan Point, Co. Donegal, April, 1898, collected by J. Hunter. Sent to the 1898 exchange of the Moss Exchange Club. This seems to be the first record for Ulster.

***Pottia Starkel** (Hedw.), C. Muell., var. **Davallii**, Sm.—Under *Gym. minutulum*, Schw. "on grassy fields above coastguards' h., White Park, Ballintoy, October, 1838," D.M.

***Mollia tenuirostris** (Hook. and Tayl.), Lindb.—A specimen labelled "Glens of Antrim, 1836," D.M., and corrected to *Tortula hibernica*, Mitten, is really the above species.

- Barbula Hornschuchii**, Schultz.—“On the walls of Carrick Castle, not in fruit, 1837,” D.M. The only Irish record. The tufts are small, dark coloured, and barren, and have not the look of *vinealis*, but seem to be correctly named. It is bracketed as doubtful in *Flora N.E. Ireland*. At first named *T. gracilis*, Hook. Grev., the specimens were corrected later to the present name.
- ***Funaria obtusa** (Dicks.), Lindb.—The specimen labelled “*Gym. fasciculare*, Hedw., Giant’s Causeway, &c., in the Co. of Antrim, 1836,” D.M., is really *F. obtusa*. *F. fascicularis* (Dicks.) Schimp., seems to be rare. The plant recorded by me in the *Flora N.E.I.* from Warren point was *P. pyriforme*.
- F. calcarea**, Wahlg.—This species has not yet been found in the North. The plant “on limestone soil, Deer Park, Cave Hill,” D.M., first named *F. Muhlenbergii*, Turn., corrected to *Gym. pyriforme*, is really that species (*P. pyriforme*).
- Amblyodon dealbatus** (Dicks.), Beauv.—It is strange that this conspicuous plant has not been found of late years. The exact Co. Antrim locality was “very rare, on a large bog, T. (townland) of Glenbuck, P. of Rasharkin,” D.M.
- Bryum proliferum** (L.) Sibth.—This species was found by S. Moore and myself in great abundance on the Ballykinler sandhills, Co. Down, April, 1898, during an excursion of the botanical section of the Belfast Field Club.
- ***Mnium silvaticum**, Lindb. (*M. cuspidatum*, Hedw.).—Shady banks, sandhills, Ballykinler, Co. Down, April, 1898, C.H.W. Found at the same time as the last species, but occurs more sparingly. Name confirmed by H. N. Dixon.
- ***M. pseudo-punctatum**, Br. & Schpr. (*M. subglobosum*, Bry. Eur.).—Bogs, Creevy Lake, Saintfield, Co. Down, C.H.W.
- Leskea polycarpa**, Ehr.—Shore of Lough Neagh, at Kinnego and Ardmore, Co. Armagh, C.H.W.
- ***Hypnum chrysophyllum** (Brid.), De N.—Dry banks by canal Middleton, Co. Armagh, June, 1885. Bare field, Taberhoney, nr. Lurgan, Co. Armagh, Nov., 1882. C.H.W.
- ***H. polygamum** (Br. Sch.), Wils.—Marshy shore of Lough Neagh, at Castor’s Bay, Co. Armagh, July, 1886, C.H.W. This and the last species were confirmed by G. A. Holt.
- H. eugyrlum**, Schimp.—Besides the locality referred to in Lett’s “Mosses of the Mourne Mountains” at Omeath, I found it in another locality, in young fruit, April, 1883, by a stream on Anglesey Mountain, Co. Louth, opposite Narrow-water.
- H. intermedium**, Lindb.—Middleton, Co. Armagh, June, 1885, C.H.W.
- ***H. sarmentosum**, Wahlg.—A few stems occur marked with “?” with a gathering of *H. cordifolium* from Ballycastle, June, 1836, D.M.

- H. stramineum**, Dicks.—Bogs at Creevy Lake, Saintfield, Co. Down, Jan., 1898, C.H.W.
- H. speciosum**, Bridel.—A specimen labelled "Glenarm and through the Co. Antrim," D.M., and named *H. albicans*, is certainly *speciosum*.
- H. lutescens**, Huds.—By canal at Middleton, Co. Armagh, June, 1885, C.H.W.
- H. prælongum**, Dill., var. **Stokesii** (Turner).—Woods, Saintfield, 1896, C.H.W.
- H. ornithopodoides**, Dill. (*P. gracile*, Sw.)—Some small barren specimens not characteristic, labelled "*Pterogonium filiforme*, Schw. on rocks near Ballygally Head and other places in Co. Antrim, 1837," D.M., on examination turned out to be *H. ornithopodoides*. There is no other specimen of that moss in the collection, and Mr. Stewart gathered it at Ballygally Head. *P. filiforme* will therefore have to be omitted from our list.
- H. heteropterum** (Bruch.), Spr.—There is a specimen named *H. catenulatum* corrected to this from "rocks, head of Glenariff, 1836," D.M. Woods at Saintfield, Co. Down, C.H.W.
- H. pulchellum**, Dicks.—"Agnew's Hill," D.M.
- *Antitrichia curtispindula** (L.), Brid.—Dungiven, Co. Derry, October, 1897, collected by Mr. J. B. Parker and sent to the Moss Exchange Club.
- Lejeunea hamatifolia** (Hook.).—"Glendoon, 1836," D.M.
- Pleurozia cochleariformis** (Weiss.).—"Abundant on moist boggy moors through the Co. Antrim, 1836," D.M.
- Trichocolea tomentella** (Ehrh.).—"Frequent in the Northern Glens," D.M. Woods at Saintfield, Co. Down, 1896, C.H.W.
- Blepharostoma trichophyllum** (Dill.).—"Glendoon," D.M.
- *Lepidozia reptans** (L.).—"Abundant in shady woods, head of Glenariff," D.M. Colin Glen, 1898, C.H.W. Woods at Saintfield and Killeen glen, Co. Down, C.H.W.
- *Cephalozia fluitans** (Nees.).—Mr. D. M'Ardle has pointed out that a specimen in Dr. Moore's collection named "aquatic var. of *J. inflata*, Huds., from near Giant's Causeway," is this species.
- *C. catenulata** (Hüb.).—"Rocks near the head of Glenbush, very sparingly, Aug., 1838," D.M., named *J. reclusa*, Tayl.
- C. sphagni** (Dicks.).—"Bogs, among sphagnum, not unfrequent, 1838," D.M.
- *Adelanthus decipiens** (Hook.).—A small specimen so named, from a "moist wood at the head of Glenariff, July, 1836," is certainly this species. Mr. M'Ardle found a few stems in a gathering of mine from Sallagh Braes, Co. Antrim, some years ago.

Two species are included in the Antrim collection which would require further examination, viz., *Scapania umbrosa* (Schrad.), "rare, only observed in Glenarm, September, 1836," D.M., and *S. subalpina* (Nees.) "in marshy places high on the mountains near Carnlough, 1837," D.M. I am not familiar with them.

- Plaglochilla spinulosa** (Dicks.)—"Glenmakerrau, Glenarm, &c., 1836," D.M. Colin Glen, Co. Antrim, and woods at Saintfield, Co. Down, C.H.W.
- Mylla Taylori** (Hook.) Gray—"Near Orra, p. of Loughguile," D.M.
- Acolea crenulata** (Gottsch.)—"Rare, on a mountain above Carnlough, Sept., 1836," D.M.
- Aneura multifida** (L.)—"On moist banks and fields, frequent in Co. Antrim," D.M.
- Lunularia cruciata** (L.)—"In flower pots, and on the common soil, Botanic Gardens, Belfast," D.M.
- Reboullia hemisphærica** (L.) Beauv. — Aughnadarragh Lake, nr. Saintfield, Co. Down, 1895, Cushendun, Co. Antrim, C.H.W. Rathfriland, Co. Down, Rev. H. W. Lett and C.H.W.
- ***Riccia glauca**, L.—"Top of Colin Glen above the rumbling hole." Templeton MSS.—Still there, Jan., 1898, S. A. Stewart and C.H.W. A plant labelled "*R. crystallina*, L., moist banks nr. Glenarm, Cushendall, &c.," D.M., is probably this plant.
- Anthoceros punctatus**, L.—"Shady banks in Glenmakerron and other places, not rare," D.M.
- Saintfield, Co. Down.

THE WHITE WAGTAIL, IN IRELAND.

BY ROBERT WARREN.

So very little was known of this wagtail (*Motacilla alba*) in Ireland, that William Thompson had never met an Irish specimen: and he thus speaks of it in his work on the Birds of Ireland:—"Is believed to be at least an occasional visitant. It is included on the following testimony. In a letter to me from Mr. R. Ball, dated 19th of June, 1846, it was stated that a few days before, when at Roundwood, he had seen a specimen of the true *M. alba*, as distinguished from *M. Yarellii*. He remarked: "We watched it for some time, though at a short distance from us, with a small telescope used for such purposes; its beautiful plumage was very distinct from that of the common species, and its habit much more sedate than is usual with wagtails; it 'wagged' but little, and walked about demurely. I am certain that I have often seen the species before." As the bird was not obtained, its occurrence would not be inserted here, without my perfect reliance on the

knowledge and acute observation of my informant." Such was all the meagre information that was obtained by Mr. Thompson of this bird in Ireland; and for several years after, nothing more was heard or seen of the White Wagtail, until the 25th of April, 1851, on which day I had the good fortune of shooting on Bartragh Island, the first authentic specimen known to have been obtained in Ireland. I met the bird in a field where some men were sowing barley, and as it followed the harrows picking up insects, my attention was attracted by its quiet demeanor and light grey plumage, so different from that of our native wagtails, and after observing it for some time, it occurred to me that it might be the rare *M. alba*, so, drawing the larger shot from my gun (that I had for rabbits) I put in a charge of no. 8, and knocked over the bird; on picking up and examining it, I felt confident that it was the rare wagtail, but to be certain of its identity, I sent the specimen to my old friend the late Dr. J. R. Harvey, of Cork, and he wrote to say, that he had no doubt of its being the true *Motacilla alba*, but unfortunately it had been so long delayed in the post office, that on its arrival it was unfit for preservation, and to his great disappointment, the specimen was lost. For many years after, nothing more was heard of the White Wagtail in Ireland, until the 29th of April, 1893.

On that date, visiting Bartragh with some friends, we met a pair of wagtails feeding on a wet plot at the base of the sand-hills and about 300 yards from where I shot the bird in 1851. These birds walked about quietly, with none of the restlessness of the common species, evidently tired after their long flight from their winter-quarters in Spain or Africa. After observing them for some time with my glass, admiring their lovely plumage, I shot one, the other bird flying right off out of sight, and we did not see it again.

The specimen was a well-marked type of *M. alba*, and is now in the collection of the Museum of Science and Art, in Dublin. Having shown the bird to my friend Mr. A. C. Kirkwood (who resides on the island), I asked him to keep a sharp look-out for these wagtails every season during the month of April, and the result of my suggestion was, that last season, towards the end of that month, he observed a beautiful bird in the light grey plumage, resting on the hill a short

distance from where I met the two birds in 1893. After looking at it for some time with his glass, he went for his gun, but in the meantime, a heavy rain squall coming on, drove it away to shelter, and when he returned to the place, the bird had disappeared. However, this season he was more fortunate, for on two occasions he met the White Wagtail on the island, and obtained three specimens out of each flock. He met the first lot of five birds on the 30th of April, feeding in a field lately sown with oats, and his attention being attracted by their light grey backs, and white cheeks, he brought his glass to bear on them, observing them for a long time, as they (like the birds previously seen) walked quietly about the field with none of the restless habits so constantly shown by the common wagtails. He then got his gun and shot three fine birds, which he kindly brought to show me. One, a perfect type of *M. alba*, was too much injured by the shot for a specimen, but the other two (equally fine birds) I sent to Mr. E. Williams of Dublin, to be preserved.

Again on the 10th May, Mr. Kirkwood came across a small flock of fifteen birds resting on the bare stony slope of a small hill, near where he saw the wagtails last season, and on looking at them with his glass, he observed that all were in the light grey plumage of *M. alba*, but on approaching for a closer view, they all rose from the hill, and pitched on the shore amongst the rocks and stones. Just then a heavy shower coming on, he said it was amusing to see them seeking for shelter from the rain under the lee of the rocks; sometimes, two or three birds might be seen huddled together on the sheltered side of rocks, or large stones, evincing a decided aversion to the rain wetting their plumage. These birds appeared to Mr. Kirkwood to be resting, and not inclined to feed. Probably being tired out after struggling against the stiff gale of N.N.W. wind that had been blowing for two or three days past, and that when passing over Bartragh, they dropped down to rest a little before continuing their flight across the sea to Iceland, which was evidently their destination.

Mr. Kirkwood obtained three birds out of this flock, and more lovely specimens of *M. alba* I never saw, the intense black of the breast and head contrasting so strongly with the snow white of the forehead and cheeks, the white extending down

the sides of the neck, almost to the shoulders. One of the specimens was very badly injured, but the other two were sent to my friend Mr. H. Saunders of London, who presented them to the Natural History Museum there.

Both these flights of wagtails met by Mr. Kirkwood only remained the one day, but a day or two after the birds seen on May 10th had left the island, they were succeeded by a third flight of five birds, which, owing to the N.N.W. wind, remained up to the 19th May, when I had the pleasure of seeing three of them.

It is a strange fact that up to the present (except on the island of Achill, where Mr. J. R. Sheridan obtained a specimen in 1893) there is no authentic record of the capture of *Motacilla alba* in any other part of Ireland than the island of Bartragh; why this island should be so favoured it is difficult to say. However, I may suggest that the birds met with on Bartragh were on their way to their breeding-haunts in Iceland, and the direct course from their winter-quarters in Spain to Iceland would be across the sea, and right over Ireland, the straight line of flight passing over Bartragh and Killala Bay. Is it not more likely that the tired birds would rest on Bartragh, the last point of land between them and Iceland, rather than on any of the more inland parts of the country? It must be evident that these birds holding such a westerly course were going direct to Iceland, for birds making Norway and Lapland their destination would keep more to the eastward, a few skirting England, while the bulk of the flight would keep along the Dutch and Danish coasts.

Moyview, Ballina.

PROCEEDINGS OF IRISH SOCIETIES.

ROYAL ZOOLOGICAL SOCIETY.

Recent gifts include a monkey from Mr. J. Wynne, a snake from Mr. J. Stewart, two Puffins and a Black-backed Gull from Dr. E. Blake-Knox. A Toggenburg Goat kid has been born in the Gardens, and twelve monkeys have been bought.

11,850 persons visited the Gardens during May.

DUBLIN MICROSCOPICAL CLUB.

APRIL, 21. The Club met in the Royal Dublin Society's rooms, Leinster House. Dr. FRAZER (President) in the chair, showed a specimen of stilbite in a volcanic vent from the Faroe Islands. The specimen had formed part of the Giesecke collection.

Mr. G. H. CARPENTER showed a new form of stridulating organ in a spider—the male of the minute erigonine *Entelecara broccha* (L. Koch). The inner corner of the coxa of the fourth leg is drawn out into a sharp tooth which scrapes over a series of ridges and furrows on the chitinated surface of the lung-plate. The specimen exhibited had been collected on the summit of Slieve Donard, Mourne Mountains, by Mr. R. Welch of Belfast, and the species is an addition to the fauna of the British Islands, having been hitherto recorded only from the Tyrolese and Swiss Alps. This stridulating organ is described and figured by the exhibitor in *Natural Science* for May, 1898 (vol. xii., pp. 319-322).

Mr. HENRY H. DIXON showed a minute organism found by Dr. J. Joly and himself last summer in Killiney Bay. It resembles the figures of *Xanthidia* found in the chalk, and consists of a spherical test bearing a number of hooked spines. A figure of the organism will appear shortly in the *Proc. Roy. Dub. Soc.*

The same member also showed sections illustrating the structure and development of peculiar endogenous rhizoids in *Lunularia cruciata*, which he found in specimens of that liverwort collected in February. The endogenous rhizoids are developed from the cells adjoining the bulb-like base of the first rhizoids. These cells, when the latter become effete, grow out as hairs through the cell-cavity of their predecessor. There may be as many as four of these endogenous rhizoids developed within the cavity of the original rhizoids. Their walls often possess the peculiar internal projections which characterise the walls of some of the rhizoids of the liverworts.

Mr. H. HANNA showed a preparation of the red seaweed *Ceramium rubrum*, C. Ag., showing minute structure of protoplasm. The method of preparation was as follows:—The plant was killed in a 3 per cent. solution of formol and left in it for one week—this acted as a slight but efficient swelling reagent, more suitable for delicate tissues than sulphuric

acid for swelling purposes; stained next in a watery solution of Hoffmann's blue, afterwards passed through dilute acid alcohol into weak glycerine, in which it remained for some time, and finally mounted in glycerine jelly, by this treatment only the fine protoplasmic connections and protoplasts remain strongly stained. The protoplasm of the filamentous thallus showed a peculiar tubular vacuolated appearance, a number of tubules lying more or less parallel to one another inside a larger tube, each tubule being apparently filled with droplets. The problem of the structure of protoplasm apart from its constitution must be settled largely by microscopical study.

Prof. T. JOHNSON showed a preparation of the spores and elaters of the slime-fungus *Trichia affinis*, of which he collected fruiting material in a wood at Howth in December, 1897. The species seems not to have been hitherto recorded from Ireland.

Mr. H. J. SEYMOUR exhibited a specimen of the so-called syenite from Cleopatra's Needle, New York. The piece was originally part of the base of the "Needle," which was trimmed off to make a flat foundation before being set up. The specimen was kindly lent by Prof. O'Reilly of the Royal College of Science.

MAY 19.—Dr. W. FRAZER (President), in the chair, exhibited a series of drawings made from the parasitic growth, *Achlya prolifera*, on gold-fish. They had been originally shown several years since, and described by him at the Microscopical Club. They were to illustrate some observations on parasitic diseases in animals.

Prof. T. JOHNSON showed a preparation of the hymenium of the dry-rot fungus, *Merulius lachrymans*, Fr. which had been found growing in the floor of a dining-room in Dublin. Though dry-rot is not uncommon in timber the fungus is not often found in fruit. It is closely related to *Polyporus*, having much shallower tubes lined with a yellowish-brown hymenium. Each basidium carries four sterigmata. Mr. R. J. Moss, F.C.S., stated that recently dry-rot attacked the wood-work of one of the rooms of the R.D.S.'s premises at Ball's Bridge, and cost the Society some £200.

Mr. G. PIM showed masses of a *Closterium*, which occurred in a water-lily pool in his garden. The individuals were exceedingly numerous, forming green patches on the water, and only appeared on the surface in or after bright sunshine.

Mr. M'ARDLE exhibited *Nostoc sphaericum*, Vauch., which he detected growing in the lobules of *Lejeunea flava* var. which he collected last year at Torc Waterfall, Killarney. Some specimens of the alga are very minute and resemble the antheridia of the liverwort; more matured specimens swell the lobule very much; and at length, under such favourable circumstances for its growth, the minute fronds which are enclosed in a colourless periderm grow through the aperture formed by the lobe and lobule of the *Lejeunea*, and are possibly carried by the current of moisture into the next empty lobule, where they quickly form the minute spherical mass so characteristic of the species.

Mr. H. HANNA exhibited sections and specimens of a new species of Truffle from Cyprus—*Terfezia aphrodites*. In *Terfezia* we have a type of Truffle in which the large masses of fertile hyphae are separated by white bands of sterile hyphae which come off from the outer hardened layer of hyphae or peridium. It is described by Chatin, in the *Bulletin de la Société Botanique de France*, 1897, p. 290.

Mr. JOSEPH WELLAND showed a new photo-micrographic apparatus, the property of Professor Cunningham, consisting of a long board, having attached above a light framework covered in with curtains and carrying a vertical sliding stage for holding plate-holders. It is used in conjunction with a projection lantern with microscopic attachments, a partition fitted with shutters being interposed between the lantern and the stage.

DUBLIN NATURALISTS' FIELD CLUB.

MAY 21.—Spite of the stormy weather nearly forty members of this Club and their friends took train to Howth to collect objects of natural history interest on Ireland's Eye. Boatmen and coastguard look-out agreed it was useless to try to make the passage. The party turned, by permission, into the Howth demesne, walked through the beautiful rhododendron dell, saw the peculiar Adder's Tongue fern in quantity, and paid a visit to the boggy patch where the Sundew, the Butterwort, and other interesting plants were seen growing.

JUNE 18.—Members and their friends travelled from Harcourt-street Station by the 10 a.m. train, reaching Rathdrum at 11.30. Here cars were taken to Drumgoff. After lunch the valley of Glenmalure and the mountain slopes, west of Drumgoff, were explored. *Saxifraga stellaris*, *Drosera rotundifolia*, *Pinguicula vulgaris*, *P. lusitanica*, several species of *Lastrea* and other ferns, &c., were obtained. Few birds were seen, and the day was not favourable to entomological collection. On the whole the ground proved disappointing, though the excursion was much enjoyed by all, thanks to the fine mountain scenery.

NOTES.

BOTANY.

FUNGI.

Bacteria attacking Ancient Bronzes.

My notice has been directed to the ulcerative disease attacking ancient bronzes. I exhibited specimens at a recent meeting of the Royal Society of Antiquaries of Ireland, and in a late number of *Nature* it is mentioned that great numbers of bacteria are present in this malady. I examined some of my specimens and can fully corroborate the discovery.

W. FRAZER.

Dublin.

MOSESSES.

Pottia recta (Mitt.) in Co. Donegal.

I discovered this rather rare moss growing in considerable abundance in April last on the bare clay of the tennis-ground by the sea at Fahan Point, Lough Swilly. I am informed by the Rev. C. H. Waddell, to whom I forwarded specimens for verification, that, so far as he is aware, it is a new record for North of Ireland, and though stated in *Flora Hibernica* to be common, it has no definite records for Ulster.

J. HUNTER.

Bridge End, Londonderry.

PHANEROGAMS.

Irish Rosæ.

M. Crépin, of Brussels, has kindly examined and named some Irish Roses which I sent to him. As there are very few records of Irish species I send particulars of the most interesting:—

Rosa involuta, Sm. (= *pimpinellifolia* × *tomentosa*).—A tall bush by the path in the lower part of Glenarm Park, not far from the Castle, Aug., 1895, Rev. H. W. Lett and C.H.W.

R. tomentosa, Sm.—M. Crépin places under this species a great many varying forms which grow in Co. Down. One from Doran's Rock, Saintfield, July, 1897, has the flowers white, each petal being edged with red, which gives a red colour to the pretty buds before opening.

R. rubiginosa, L.—Doran's Rock, Saintfield, July, 1897.

R. canina, L., var. *tutetiana* (Leman).—Saintfield, Co. Down, Aug., 1895. Var. *dumalis* (Bechst.).—Saintfield, June, 1895. Var. *verticillacantha* (Mérat).—By Aughnadarragh Lake, Saintfield, Co. Down, Sept., 1894. This name is given to a striking form with small globose capsules and protruding styles, which I have also collected in another locality near Saintfield village.

R. glauca, Vill.—In hedge of field, Saintfield Vicarage, Aug., 1895; demesne, Saintfield, Aug., 1896; Aughnadarragh, Aug., 1894, all in Co. Down.

In a paper by M. Crépin on the geographical distribution of *R. stylosa*, Desv. (1892), he states that he has seen a specimen of this rose from Newcastle, Co. Tipperary, collected by M. Nicholson. This adds a third to the two previously recorded localities for this rare Irish species. I note it here as it might be overlooked.

C. H. WADDELL.

Saintfield.

ZOOLOGY.

WORMS.

Irish Annelids.

I am anxious, now that the collecting season has come again, to complete my researches among Irish Annelids. I should be specially grateful if naturalists would send specimens of the smaller kinds found in ponds, ditches, gutters, sewage, manure heaps, water-weeds, backwash refuse by lakes, ponds, rivers and estuaries, and other localities. Living material sent in small boxes or tubes shall have immediate attention.

HILDERIC FRIEND.

Ocker Hill, Tipton, Staffs.

INSECTS.

Entomological Notes from Poyntzpass, &c.

Vanessa urtica was as usual the first butterfly to appear on the wing. I noticed a specimen flying on March 20th; and on the 22nd of the same month I observed *Bombus terrestris*, L., flying about my garden. On April 15th, several *Pieris rapæ* appeared on the wing, and on the 19th *Pararge egeria* was flying in its usual haunt, along a big laurel hedge. Mr. J. H. Johnston's record of *Pararge megera* on March 20th (*Irish Naturalist*, vii. p. 149) is remarkable. Mr. Barrett (*British Lepidoptera*, vol. i.) notes the earliest appearance known to him as April 25th, and says nothing about the species hibernating. Evidently therefore Mr. Johnston's specimens were an early emergence brought on by the period of fine weather which occurred about March 20th. On the same day as I noticed *P. egeria*, I saw a number of *Andrena cineraria* at a bank on the edge of a small lake near here. On April 21st I took in my own fields a few coleoptera, the only noteworthy species being *Pterostichus nigrita*, *Hister neglectus*, *Alophus triguttatus*, and *Mecynus pyrauster*. A few days afterwards I was walking through a field belonging to Colonel Alexander when I noticed a small reddish beetle sitting on the end of a blade of grass. I had no net with me, and tried to catch it with my hand, but it eluded me and fell to the ground and no amount of searching among the

roots of grass availed to reveal its whereabouts. Two days afterwards I returned, fully equipped with net and bottle, and there was my friend in exactly the same place sitting as before on the end of a blade of grass. This time I was successful in capturing it and found it to be *Lochmaea crataegi*, Forst. ? This was on April 27th, and though I often returned to the place I got no other specimen till June 2nd, when I beat another off hawthorn blossom. A fine female *Smerinthus populi* emerged in my breeding cage on April 26th. The larva had been taken on a poplar tree at the foot of my lawn.

On April 28th I took a trip to Greenore, but a cold easterly wind prevented my meeting as many insects as I had hoped. Though Mrs. Johnson and I worked every likely spot with all care we took but little. The best capture was *Anthicus scoticus*, of which we captured a good many crawling on the shingle. On former occasions I took it about *Honckenya peploides*, but though the plant was there the beetles seemed to prefer the stones. Besides this we obtained *Bembidium femoratum*, *Quedius semicaneus*, *Cafius xantholoma*, *Saprinus aeneus*, and *Cassida nobilis*, this last under stones and evidently either newly emerged or just awakening from winter's sleep.

I saw the first *Anthocharis cardamines* on May 5th, and towards the end of the month captured a very small male in one of my fields; it measures 27 m.m. in expanse. The present month promises well in point of weather, and insects are beginning to show themselves. I captured some *Telephorus nigricans*, Müll., on grass and hawthorn blossom, and by sweeping *Byturus tomentosus*, *Hister neglectus*, *Epuraea florea*, *Anthonomus pedicularius*, *Phyllobius argutatus*, &c. On the 11th inst. a nice specimen of *Charocampa porcellus* emerged; Mrs. Johnson took *Hadena thalassina*, and I obtained a dark *Spilosoma menthastris*.

W. F. JOHNSON.

Poyntzpass.

MOLLUSCS.

Land Mollusca of Co. Tipperary.

During a day's visit to Cashel early in May, I spent about an hour or less collecting on "The Rock," and a few minutes at Holycross Abbey, near Thurles, obtaining the following species:—*Hyalinia cellaria* and var. *albina*, *H. alliaria*, var. *viridula*, *Arion ater*, *Limax flavus*, *L. marginatus*, *Helix rotundata*, *H. rufescens*, *H. intersecta*, *Vertigo edentula*; the foregoing at Cashel only. *Arion hortensis*, *Agriolimax agrestis* (mostly very light coloured, but one very dark purple var. on Rock of Cashel), *Helix rupestris*, *H. nemoralis* (latter plentiful on the Rock, sheltering in tufts of the Wall Pellitory high up on Cormac's Chapel, &c.), *H. aspersa*, *Pupa cylindracea* and *Clausilia bidentata*; all common at both Cashel and Holycross. *Arion circumscriptus* at Holycross only, one or two on river-bank.

R. WELCH.

Belfast.

BIRDS.

Bird Notes from the North of Ireland.

The following notes of our rarer visitants have not, I think, been recorded before.

On 8th November, 1895, a male Rough-legged Buzzard (*Buteo lagopus*) was shot at Portaferry, Co. Down.

A Grey Phalarope (*Phalaropus fulicarius*) was picked up at Ballymoney, Co. Antrim, in October, 1896.

A male Hawfinch (*Coccothraustes vulgaris*) was shot at Hillsborough, Co. Down, on 30th December, 1897.

On 21st September, 1897, a Hoopoe (*Upupa epops*) was destroyed near Lurgan, Co. Armagh, and two days previously an immature male Marsh-Harrier (*Circus aeruginosus*) was shot at Cullybackey, Co. Antrim. It would appear that any uncommon bird has a poor chance of surviving its visit to the over-populated "Black North."

ROBERT PATTERSON.

Belfast.

The Protection of Wild Birds.

We learn from the *Times* of June 6th that a somewhat novel application under the Wild Birds Act is pending for determination by Judge Adams and the County Limerick magistrates. Some time since complaint was made at the meeting of the Limerick Fishery Conservators' Board of the damage done to the salmon spawning beds of the Shannon by Mergansers, a species of wild duck, which preyed on the young fish. It was agreed to provide the bailiffs temporarily with guns and shot for the destruction of the birds in the close season, but the order was not adhered to. To-day Judge Adams was applied to to permit the shooting of Mergansers during the close season, and also of seagulls from March to August, each, or during all the close season for wild birds. Judge Adams was asked under the ninth section of the Act to allow a petition to the Lord Lieutenant for the exemption of Mergansers and seagulls from the operation of the statute for the protection of wild birds, but having consulted the stipendiary, Mr. Hickson, he was against the destruction of any wild birds in the close season. It was finally decided to direct the Clerk of the Crown to summon a meeting of the county magistrates on Tuesday, when evidence will be heard and a vote taken as to whether the Lord Lieutenant will be petitioned to allow the slaughter of the birds which Mr. Anthony Mackey, lessee of eel weirs at Castleconnell, says are destroying the eel fry. The result of the application is giving rise to much interest, and, should the magistrates decide on acceding to the application, the action to be taken by the Lord Lieutenant will be a matter for much speculation. The district proposed to be exempted is from the city of Limerick to Killaloe on the Upper Shannon.

Spring Migrants at Poyntzpass.

The Chiffchaff and Willow Wren were later than usual this year. The former did not arrive till April 9th, and the latter till April 14th. The Swallow appeared on April 13th, the Corncrake on the 21st, the Cuckoo on the 24th, and the Swift on May 7th. I had no opportunity of noting the arrival of either the House or the Sand Martin, as neither build in the immediate neighbourhood.

W. F. JOHNSON.

Poyntzpass.

The Long-tailed Duck In Belfast Lough.

I have read with much interest in the May issue of the *Irish Naturalist* Mr. Warren's description of the appearances of this rare and beautiful Duck in Killala Bay; and, now that attention has thus recently been drawn to it, I wish to add some scant and brief notes of its occurrence in Belfast Lough and two other localities in the North-east. I shot one in this (Belfast) Lough in March, 1869, and another a few years later. My nephew, Mr. Robert Patterson, shot one near this in October, 1888. A few years ago, perhaps about 1890, I was staying at a friend's house near Strabane, when I was shown a "strange Duck" that had been shot at a small mountain lake in that locality (Co. Tyrone). It was a Long-tailed Duck. On 29th November, 1895, Colonel Bruce of Castledawson, sent me one; and on 2nd November, 1896, his son, Major Bruce, of Toomebridge, sent me another; the latter one of five, both of which had been shot on Lough Beg, Cos. Antrim and Derry. They were sent to me for identification, thus showing that they are not commonly met with there. The above were all immature birds; these occurrences of the species inland are interesting, for it is generally considered a marine duck.

I saw one near this on 31st October, 1897; but my most recent, and certainly most interesting record is that twice this week, namely, on 9th and 11th May (1898), I saw three mature birds near Strandtown (between Belfast and Holywood) in this county. On the first occasion they were swimming near the land; on the second they were standing on a small patch of the bank just awash above the ebbing tide.

R. LLOYD PATTERSON.

Holywood, Co. Down.

MAMMALS.

Breeding of the Marten In Co. Waterford.

I am informed by Miss Louisa Fairholme, of Comragh House, that on the 18th April, 1897, a Marten and her cubs were taken in the vicinity. Some boys were near a stone-faced bank forming the boundary of a wood when they heard a sound like the crying of kittens proceeding from the bank. They set to work to make a hole, and pulled out three young blind Martens. There was a fourth, but they failed to reach it. The three little cubs were put in a cage and a trap set beside it, in which the mother was soon caught.

Attempts to put her in a box with her cubs proved a failure. First the parent, and then the cubs died. The old Marten was preserved, but the young ones were not.

I remember a similar instance here nearly fifty years ago, when I went out with my parents for a Sunday walk, and my father found three little blind Martens within the woodwork of a summer-house. A trap was set and the old Marten caught and kept in confinement for some weeks.

R. J. USSHER.

Cappagh, Co. Waterford.

A COUNTY FLORA

The Flora of Perthshire, by FRANCIS BUCHANAN W. WHITE, M.D., F.L.S., F.E.S.; edited . . . by James W. H. Traill, A.M., M.D., F.R.S.; pp. lx. + 408, portrait and map. Blackwood and Sons, 1898.

The premature death of Dr. Buchanan White in December, 1894, at the age of 52, delayed the appearance of the work on which he had been for many years engaged—an account of the botany of his native county. But the results of his labours are now laid before us by the authority of the Perthshire Society of Natural Science, and under the able editorship of Professor Traill of Aberdeen. The book, a well printed octavo volume, includes full introduction, a memoir of the author, a list of his published papers, and a reprint of his address to the Perthshire Society on the Origin of the Flora of Perthshire, followed by an enumeration of the plants of the county, with ample details of their horizontal and vertical distribution. Dr. White was a keen critical botanist, and the genera *Rubus*, *Rosa*, and especially *Salix*, in which he was recognised as a leading authority, are set forth in the full length of the modern extended nomenclature. In alpine plants the list is of course remarkably rich. Fancy a county with 89 peaks rising above 3,000 feet! How the mouth of the English or Irish botanist waters for such alpine regions. An excellent map, shaded according to the 500, 1,000, 2,000, and 3,000 foot contour lines, shows the boundaries of the thirteen districts into which the author divided his great county of 2,589 square miles, for botanical purposes; and in the case of even the commonest plants, the enumeration of the names of these thirteen districts testifies to the universal distribution of the species under consideration—an arrangement more necessary than might appear, since the exclusively alpine character of some districts, and the essentially lowland nature of others, cause many of the usually ubiquitous species to have in Perthshire a distinctly limited distribution.

In every respect the book is worthy of its author, and it will take a high rank among the many county floras which the labours of English and Scottish botanists have produced. May many Irish workers follow their good example.

R. I.L. P.

THE FUNGI OF THE COUNTIES OF DUBLIN AND WICKLOW.

BY GREENWOOD PIM, M.A.

THE following summary of the Fungi hitherto observed in the Dublin district is to a great extent the substance of two lists, one compiled by me in 1878 for the handbook published in connection with the visit that year of the British Association, and the other published by Dr. McWeeney and myself in 1893.¹ To this material have been added such species as have come under my notice since, and Dr. McWeeney has kindly added a very large number of interesting forms which he has found within the past five years. Both lists—with the exception of the Uredines in the latter—are arranged on the lines of Dr. Cooke's "Handbook." Within the last few years the classification of the Fungi has been completely revolutionised: new genera by scores have been established, and it is not always easy to find one's old friends under their new names. Hence, to bring this list at all up to date involved its being entirely recast. The arrangement of Mr. Massee's "British Fungus Flora" has been followed except in the case of the Uredines which are arranged according to Dr. Plowright, the Pyrenomycetes in which Saccardo's grouping has been adopted, and that of Lister in the appendix on Mycetozoa.

The catalogue is not a very long one, but it must be borne in mind that it is the work of only two individuals—both of whom have had other pressing occupations, so that they could devote but a portion of their leisure to the work.

When I first commenced the study of mycology, the identification of these plants—never a very easy matter—was much more difficult than it is now. Such works as Dr. Cooke's "Illustrations" and "Mycographia," Mr. Massee's "British Fungus Flora," Saccardo's "Sylloge Fungorum," and many more were not available, and for some years I worked single-handed, till about 1888 Dr. McWeeney joined me. He has added a very large number of species, some new to the British Flora—some even to science. Under these circumstances mistakes were inevitable—and no doubt have occurred—while it is quite certain that there are a large number of species which have

¹ *Irish Nat.*, vol. ii., pp. 245-9; 257-60.

been overlooked. A few years ago absolutely nothing was known of the Fungi of Ireland, so that it was no exaggeration to say that it was not known for certain that even *Puccinia graminis* existed there. Except the Dublin district; Armagh, Antrim, and Down, of which Rev. H. W. Lett has published a list in the *Proceedings* of the Belfast Naturalists' Field Club¹; and a few species recorded by me in Cork and Kerry, Ireland is still a complete *terra incognita*. It is to be hoped that the visit of the British Mycological Society this autumn will result in the addition of a large number of species to the list.

BASIDIOMYCETES.

A. GASTROMYCETES.

Fam. I. HYMENOGASTREÆ.	Fam. IV. LYCOPERDEÆ.
Octaviania asterosperma, Vitt.	Lycoperdon cælatum, Fr. bovista, L. (giganteum). plumbeum, P. saccatum, Vahl. gemmatum, Batsch. pyriforme, Schaef. nigrescens, Vitt.
Fam. II. SCLERODERMEÆ.	Geaster rufescens, P. fimbriatus, Fr. Michelianus, W.G. Sul.
Scleroderma vulgare, Fr. bovista, Fr.	Fam. V. PHALLOIDEÆ.
Fam. III. NIDULARIÆÆ.	Ithyphallus impudicus, Fisch.
Cyathus striatus, Hfin. vernicosus, D.C.	Mutinus caninus, Fr.
Sphaerobolus stellatus, Tode.	

B. HYMENOMYCETES.

Fam. I. TREMELLINÆÆ.	Dacryomyces macrosporus, B. & Br. deliquescent, Dub. stillatus, Nees.
Hirneola auricula-judæ, Berk.	Apyrenium lignatile, Fr.
Exidia albida, Bref.	Calocera viscosa, Fr.
Uloccolla foliacea, Bref.	Clavaria coralloides, L. cinerea, Bull. cristata, Holmes, K.
Tremella mesenterica, Retz. viscosa, Bat. indecorata, Somm.	

Clavaria
 rugosa, Bull.
 abietina, Schum.
 pupurea, Mull.
 vermicularis, Scop.
 uncialis, Grev.
 inacea, Fr.
 inæqualis, H. Daw.

Typhula
 gyrans.
 var. Grevillei.

Pistillaria
 culmigena, Mont.
 quisquiliaris, F.

Fam. III. THELEPHOREÆ.

Coniophora
 puteana, Mass.

Thelephora
 anthocephala, Fr.
 laciniata, P.

Soppittiella
 cristata, Mass.
 cæsia, Mass.
 sebacea, Mass.

Peniophora
 quercina, Cke.
 cinerea, Cke.

Hymenochæte
 corrugata, Bk.

Corticium
 calceum, Fr.

Stereum
 purpureum, Pers.
 hirsutum, Fr.

Craterellus
 cornucopioides, Fr.
 sinuosus, Fr.
 var. crispus.

Cyphella
 Pimii, Phill.
 capula, Fr.
 Goldbachii, Wein.

Solenia
 anomala, Fr. var. ochracea,
 Mass.

Fam. IV. HYDNRÆ.

Hydnum
 repandum, L.
 ferrugineum, Fr.
 ochraceum, P.
 niveum, P.
 plumosum, Duby.

Radulum
 quercinum, Fr.

Grandinia
 granulosa, Fr.

Odontia
 barba-jovis, Fr.

Fam. V. POLYPOREÆ.

Merulius
 lachrymans, Fr.
 corium, Fr.

Dædalea
 quercina, P.
 unicolor, Fr.

Poria (=Polyporus)
 vaporaria, Fr.
 obducens, P.
 bombycina, Fr.

Polystictus (=Polyporus)
 perennis, Fr.
 hibernica, B. and Br.
 versicolor, Fr.
 velutinus, Fr.
 radiatus, Fr.

Fomes (=Polyporus)
 ulmarius, Fr.
 cytisinus, Fr.
 fomentarius, Fr.
 igniarius, Fr.
 salicinus, Fr.
 fraxineus, Fr.
 ribis, Fr.

Polyporus
 lentus, Bk.
 brumalis, Fr.
 rufescens, Fr.
 squamosus, Fr.
 melanopus, Fr.
 varius, Fr.
 elegans, Fr.
 giganteus, Fr.
 sulphureus, Fr.
 dryadeus, Fr.
 hispidus, Fr.
 betulinus, Fr.
 fumosus, Fr.
 armeniacus, Bk.

Fistulina
 hepatica, Fr.

Boletus
 luteus, L.
 elegans, Schum.
 flavus, With.
 chrysenteron, Fr.
 subtomentosus, L.
 cyanescens, Bull.
 badius, L.
 bovinus, L.

Boletus

granulatus, L.
pachypus, Fr.
edulis, Bull.
satanas, Lenz.
piperatus, Bull.
luridus, Schaeff.
laricinus, Bk.
scaber, Fr.

Gyrodon

rubellus, M'W.

Fam. VI. AGARICINÆ, &c.

Coprinus

comatus, Fr.
atramentarius, Fr.
hemerobius, Fr.
domesticus, Fr.
extinctorius, Fr.
tomentosus, Fr.
niveus, Fr.
micaceus, Fr.
radiatus, Fr.
plicatilis Fr.

Anellaria (Panæolus)

finiputris, Karst.
separata, Karst.

Panæolus

papilionaceus, Berk.
campanulatus, Linn.
phalenarum, Fr.

Psathyrella

gracilis, Fr.
disseminata, Pers.

Gomphidius

glutinosus, Fr.
viscidus, Fr.

Psathyra

spadiceo-grisea, Schaeff.

Psilocybe

ericæ, P.
areolata, Fr.
spadicea, Fr.
fœniseeii, P.
clivensis, B. and Br.

Hypholoma

sublateritium, Schaeff.
epixanthum, Fr.
fasciculare, Hud.
dispersum, Fr.
velutinum, P.
appendiculatum, Bull.
egenulum, B. and Br.

Stropharia

æruginea, Curt.
semiglobata, Batsch.

Agaricus

campestris, L.
var. silvicola, Vitt.
var. vaporarius, Otto.
arvensis, Schaeff.
silvaticus, Schaeff.

Paxillus

panæolus, Fr.
involutus, Fr.
panuoides, Fr.

Cortinarius (Hygrocybe)

armeniacus, Fr.
(Dermocybe)
anomalus, Fr.
miltinus, Fr.
sanguineus, Fr.
uliginosus, B.

(Inoloma)

violaceus, L.
sublanatus, Fr.

(Myxacium)

collinitus, Fr.

(Phlegmacium)

varius, Fr.
talus, Fr.
purpurascens.
largus, Fr.

Crepidotus

mollis, Fr.
alveolus, Lasch.

Flammula

lenta, P.
flavida, Schaeff.

Galera

tenera, Schaeff.
ovalis, Fr.
hypoanor, Batsch.
uniophila, Lasch.

Naucoria

melinoides, Fr.
sideroides, Bull.
pediades, Fr.
semiorbicularis, Bull.
conspersa, P.
scolecina, Fr.

Hebeloma

testaceum, Batsch.
crustuliniforme, Bull.
longicaudum, P.

- Inocybe*
scabra, Fr.
fibrosa, Low.
fastigiata, Fr.
Curreyi, B.
rimosa, Bull.
eutheles, B. & Br.
geophylla, Fr.
destricta, Fr.
perlata, Cke.
- Bolbitius*
tener, B.
- Pholiota*
aurea, Walt.
erebia (= *Leveilliana*).
dura, Bolt.
præcox, P.
capistrata, Cke.
squarrosa, Mull.
adiposa, Fr.
aurivella, Batsch.
mutabilis, Schaeff.
marginata, Batsch.
- Claudopus*
dependens, Batsch.
- Ecclia*
variabilis, Pers.
- Clitopilus*
prunulus, Scop.
cretatus, B. & Br.
- Leptonia*
lampropoda, Fr.
æthiops, Fr.
- Nolanea*
pascua, P.
- Entoloma*
jubatum, Fr.
- Pluteus*
nidosus, Fr.
- Volvaria*
speciosa, Fr.
parvula, Fr.
- Panus*
torulosus, Fr.
stypticus, Fr.
- Cantharellus*
cibarius, Fr.
tubæformis, Fr.
lobatus, Fr.
retirugus, Fr.
- Nyctalis*
parasitica, Fr.
- Hygrophorus*
ceraceus, Wulf.
coccineus, Schaeff.
miniatus, Fr.
puniceus, Fr.
conicus, Fr.
psittacinus, Schaeff.
pratensis, Fr.
virgineus, Wulf.
niveus, Fr.
- Pleurotus*
ulmarius, Bull.
subpalmatum, Fr.
craspedius, Fr.
mitis, P.
acerosus, Fr.
septicus, Fr.
- Omphalia*
pyxidata, Bull.
muralis, Sou.
telmatiaea, B. and Cke.
 (= *affricata*).
umbellifera, L.
fibula, Bull.
- Clitocybe*
nebularis, Batsch.
inornata, Low.
odora, Low.
cerussata, Fr.
candicans, P.
gallinacea, Scop.
infundibuliformis, Schaeff.
ectypa, F.
dealbata, P.
geotropa, Bull.
inversa, Scop.
cyathiformis, Bull.
brumalis, Fr.
fragrans, Low.
difformis, P.
- Laccaria*
laccata, Scop.
bella, P.
- Lactarius*
torminosus, Schaeff.
scrobiculatus, Fr.
insulsus, Fr.
zonarius, Fr.
hysginus, Fr.
blennius, Fr.
pyrogalus, Fr.
piperatus, Fr.
vellerens, Fr.
deliciosus, Fr.

Lactarius

pallidus, Fr.
 quietus, Fr.
 rufus, Scop.
 volemus, Fr.
 subdulcis, Fr.

Russula

subfoetens, Smith.
 alutacea, Fr.
 cyanoxantha, Schaeff.
 decolorans, Fr.
 vesca, Fr.
 nigricans, Fr.
 lepida, Fr., var.
 adusta, Fr.
 furcata, Fr., var. ochroviridis,
 Cke.
 delicata, Fr.
 heterophylla, Fr.
 virescens, Fr.
 depallens, Fr.
 rubra, Fr.
 ochroleuca, Fr.
 foetens, Fr.
 sardonica, Fr.
 emetica, Fr.

Mycena

capillaris, Fr.
 pterigena, Fr.
 hiemalis, Osb.
 corticola, Fr.
 tenerrima, Bk.
 stylobates, P.
 vulgaris, P.
 epipterygius, Scop.
 galopoda, Fr.
 cruenta, Fr.
 vitilis, Fr.
 iris, Bk.
 filipes, Bull.
 alcalina, Fr.
 polygrammus, Bull.
 galericulata, Scop.
 lactea, P.
 pura, P.
 elegans, P.

Collybia

radicata, Relk.
 platyphylla, Fr.
 fusipes, Bull.
 butyracea, Bull.
 velutipes, Fr.
 confluens, P.
 conigena, P.
 tuberosa, Bull.
 collina, Scop.
 tenuicella, P.
 acervata, Fr.

Collybia

dryophila, Bull.
 clavus, Linn.
 plexipes, Fr.
 atrata, Fr.
 protracta, Fr.

Marasmius

urens, Fr.
 peronatus, Fr.
 oreades, Fr.
 terginus, Fr.
 impudicus, Fr.
 Vaillantii, Fr.
 rotula, Fr.
 gramineus, Bk.
 androsaceus, Fr.
 insititius.
 Hudsoni, P.
 epiphyllus, Fr.
 ramealis, Fr.

Tricholoma

nictitans, Fr.
 Schumacheri, Fr.
 flavo-brunneum, Fr.
 virgatum, Fr.
 rutilans, Schaeff.
 luridum, Fr.
 columbetta, Fr.
 scalpturatum, Fr.
 vaccinum, Fr.
 imbricatum, Fr.
 murinaceum, Bull.
 terreum, Schaeff.
 brevipes, Bull.
 lascivum, Fr.
 caelatum, Fr.
 gambosum, Fr.
 album, Fr.
 personatum, Fr.
 nudum, Bull.
 cinerascens, Bull.
 melaleucum, P.
 grammopodium, Bull.
 humile, P.
 subpulverulentum, P.
 immundum, Bk.

Armillaria

ramentacea, Bull.
 mellea, Vahl.
 mucida, Schrad.

Lepiota

procera, Scop.
 cristata, A. and S.
 holosericea, Fr.
 cepæstipes, Low.
 granulosa, Batsch.
 amianthina, Scop.
 var. Broadwoodiæ, B. & Br.
 delicata, Fr.

Amanitopsis
vaginata, Bull.

Amanita
phalloides, Fr.
mappa, Fr.
muscaria, Fr.
excelsa, Fr.
strobiliformis, Vitt.
rubescens, Fr.
spissa, Fr.
lenticularis.
ceciliæ, B & Br.
pantherinus, Fr.

Fam. VII. USTILAGINÆÆ.

Ustilago
segetum, Bull.
flosculorum, D.C.
receptaculorum, Fr.
Vaillantii, Tul.

Tilletia
tritici, Bk.

Urocystis
anemones, Pers.
violæ, Sow.

Entyloma
ranunculi, Bon.

Fam. VIII. UREDINÆÆ.

Uromyces
fabæ, Pers.
geranii, D.C.
dactylidis, Otth.
poæ, Rabh.
rumicis, Schum.
anthyllidis, Grev.
alchemillæ, Pers.
ficariæ, Schum.

Puccinia
galii, Pers.
calthæ, Lk.
silenes, Scv.
variabilis, Grev.
lapsanæ, Schlz.
violæ, Schum.
pimpinellæ, Strauss.
apii, Ca.
menthæ, Pers.
primulæ, D.C.
pulverulenta, Grev.
saniculæ, Grev.
vincæ, D.C.
graminis, Pers.
coronata, Ca.
phalaridis, Plow.
sessilis, Schr.

Puccinia
rubigo-vera, D.C.
poarum, Niels.
caricis, Schum.
obscura, Schrot.
arundinacea, Hed.
molinia, Tul.
suaveolens, Pers.
bullata, Pers.
hieracii, Schum.
taraxaci, Plow.
oblongata,
centaureæ, Mart.
pruni, Lk.
smyrni, Ca.
epilobii, D.C.
umbilici, Grev.
Fergussoni, B. & Br.
fusca, Rell.
bunii, D.C.
glomerata, Grev.
malvacearum, Mont.
circae, Pers.
veronicarum, D.C.
glechomatis, D.C.
buxi, D.C.
annularis, Strauss.

Triphragmium
ulmaria, Schum.

Phragmidium
fragariastris, D.C.
violaceum, Schlz.
rubi, Pers.
subcorticatum, Schrank.

Gymnosporangium
juniperinum, Lev.
sabinæ, Fr.

Melampsora
helioscopiæ, Pers.
lini, Pers.
farinosa, Pers.
populina, Lev.
hypericorum, D.C.
betulina, Pers.

Coleosporium
senecionis, Pers.
sonchi, Pers.
euphrasiæ, Schm.

Æcidium
grossulariæ, Gmelin.
periclymeni, D.C.

Protomyces
macrosporus, Ung.
menyanthis, De By.

C. PHYCOMYCETES.

Fam. I. MUCORACEÆ.

Pilobolus
crystallinus, Tode.

Mucor
mucedo, Linn.
var. *caninus*.
stercoreus, Link.
clavatus.

Spinellus
fusipes, Van Tiegh.

Sporodinia
aspergillus, Schrot.
= (*Mucor ramosus*).

Thamnidium
elegans, Link.

Chaetocladium
Brefeldii, Van T.

Mortierella
sp.—on fish.

Fam. II. PERONOSPACÆ.

Cystopus
candidus, Lev.
tragopogonis, Schroet.

Phytophthora
infestans, De By.

Plasmopara
pygmaea, Schroet.
nivea, Schroet.

Bremia
lactuca, Regl.

Peronospora
parasitica, De By.
arborescens, De By.
trifoliorum, De By.
lamii, De By.
effusa, Rab.
urticae, De By.
Schleideni, Ung.
candida, Fckl.

Fam. III. SAPROLEGNIACEÆ.

Saprolegnia
ferox, Nees.
philomukes, W. Sm.

Pythium
de Baryanum, Hess.

Empusa
nusca, Cohn.

Synchytrium
taraxaci, De By.

D. HYPHOMYCETES.

Fam. I. MUCEDINES.

Oospora
fasciculata, S. and V.
crustacea, Sacc.
microsperma, S. and V.

Fusidium
griseum, Link.

Monilia
aurea, Geneb.

Cylindrium
heteronemum, Sacc.
flavo-virens, Bon.

Geotrichum
candidum, Lk.

Oidium
Tuckeri, Bk.
farinosum, Cke.
chrysanthemi, Rub.
monilioides, Lk.

Rhopalomyces
candidus, B. & Br.
pallidus, B. & Br.

Botryosporium
diffusum, Ca.
pulchrum, Ca.

Cephalosporium
acremonium, Ca.

Papulaspora
sepedonioides, Preuss.

Aspergillus
glaucus, Link.
candidus, Lk.

Penicillium
glaucum, Link.
candidum, Link.
bicolor, Fr.

Haplaria
grisea, Lk.

- Acremonium**
 verticillatum, Lk.
- Rhinotrichum**
 repens, Preuss.
- Sporotrichum**
 flavissimum, Lk.
 sulphureum, Grev.
- Botrytis**
 Tilletii, Desm.
 dichotoma, Ca.
 (Polyactis)
 vulgaris, Fr.
 cana, K. and Schm.
 cinerea, Pers.
- Sepedonium**
 chrysospermum, Fr.
- Asterophora**
 agaricicola, Ca
- Verticillium**
 aspergillus, B. & Br.
 nanum, B. & Br.
- Clonostachys**
 araucaria, Ca.
- Diplocadium (Dactylium)**
 minus, Bon.
 macrosporum, Mass.
- Trichothecium (Dactylium)**
 roseum, Lk.
 piriferum, Sacc.
 obovatum, Sacc.
- Arthrobotrys**
 rosea, Mass.
- Mycogone**
 rosea, Lk.
- Dactylium**
 dendroides, Fr.
- Ramularia**
 cryptostegiae, Pim.
 rapae, Pim.
 urticae, Ces.
- Septocylindrium**
 Bonordenii, Sacc.
 elongatisporum, Sacc.
- Helicomycetes**
 roseus, Lk.
- Fam. II. DEMATIÆ.
- Torula**
 expansa, Pers.
 pulvillus, B. & Br.
 pulveracea, Ca.
 ovalispora, Bk.
 herbarum, Lk.
 parasitica, Pim.
 sporendonema, B. & Br.
- Echinobotryum**
 atrum, Ca.
- Stachybotrys**
 atra, Ca.
 lobulata, Bk.
- Periconia**
 byssoides, Pers.
- Zygodesmus** sp.
- Acremoniella**
 fusca, Sacc.
- Haplographium**
 delicatulum, B. & Br.
- Myxotrichum**
 chartarum, Kze.
 deflexum, Bk.
- Menispora**
 lucida, Ca.
 ciliata, Ca.
- Stachylidium**
 cyclosporum, Grove.
- Chalara** sp.
- Bispora**
 monilioides, Ca.
- Passalora**
 bacilligera, M. and Fr.
- Polythrincium**
 trifolii, Kze.
- Cladosporium**
 epiphyllum, Nees.
 herbarum, Lk.
 nodulosum, Ca.
- Clasterosporium**
 opacum, Sacc.
- Septonema**
 irregulare, B. & Br.
- Helminthosporium**
 tilia, Fr.
 velutinum, Lk.
 simplex, Kze.
 gymnostachyii, Pim.
- Heterosporium**
 echinulatum, Cke.
- Sporoschisma**
 mirabile, B. & Br.
- Dendryphium**
 comosum, Wallr
- Coniothecium (Sporodesmium)**
 effusum, Ca.
- Speira**
 toruloides, Ca.
- Tetraploa**
 aristata, B. & Br.

Macrosporium
cheiranthi, Fr.

Septosporium
bulbotrichum, Ca.

Fumago
vagans, P.

Pimia
parasitica, Grove.

Fam. III. STILBEÆ.

Stilbum
erythrocephalum, Ditm.
tomentosum, Schr
vulgare, Tode.
fimetarium, B. & Br.

Isaria
fuciformis, Bk.

Ceratium
hyduoides, A. and S.

Sporocybe
byssoides, Bon.

Graphium
Grovei, Sacc

Stysanus
stemonitis, Ca.
and a branched var.
putredinis, Ca.
ulmariae, M'W.

Tuberculina
persicina, Sacc.
vinosa, Sacc.

Ægerita
candida, Pers.

Volutella
ciliata, Fr.
setosa, Bh.
phaii, Pim.

Bactridium
flavum, K. and S.

Epicoccum
neglectum, Desm.
var, papaveris.
purpurascens, Ehr.

ASCOMYCETES.

Fam. I. GYMNOASCEÆ.

Ascomyces
deformans, Bk.

Gymnoascus
Reesii, Baran.
fraxini, De Not.
sp. (on Pteris).

Fam. II. HYSTERINEÆ.

Hypoderma
commune, Duby.
hederæ, De Not.

Lophodermium
arundinaceum, Chev.

Fam. III. DISCOMYCETES.

Coccomyces
coronatus.

Schizothyrium
ptarmicæ, Desm.

Trochila
lauro-cerasi, Fr.
ilicis, Crouan.

Rhytisma
acerinum, Fr.

Patellaria
caestiae, De Not.

Heterosphaeria
patella, Grev.
sclerodermis Mass.

Propolis
faginea, Karst.

Bulgaria
polymorpha, Wettstein

Ombrophila
clavis, Cke.
brunnea, Phil.

Orbilina
vinosa, Karst.
leucostigma, Fr.
var. xanthostigma, Rehm.
rubella, Karst.

Caloria
fusarioides, Fr.

Coryne
atrovirens, Sacc.

Ascobolus
glaber, P.
furfuraceus, P.

Saccobolus
violascens, Boud.

- Ascophanus**
 argenteus, Boud.
 equinus, Mass.
 var. ciliatus, Phil.
- Pseudopeziza**
 trifolii, Fckl.
- Mollisia**
 atrata, Karst.
 atrocinerea, Phil.
 cinerea, Karst.
 filicum, Phil.
 chrysostigma, Mass.
 arundinacea, Phil.
- Helotium**
 citrinum, Fr.
 claro-flavum, Bk.
 virgultorum, Karst.
 scutula, Karst.
 cyathoideum, Karst (= urticæ).
 renisporum, Ellis.
 epiphyllum, Fr.
 bolare, Mass.
 fagineum, Fr.
- Ciboria**
 pseudotuberosa, Sacc.
 ochroleuca, Mass.
 caucis, Fckl.
- Sclerotinia**
 sclerotiorum, Mass.
- Chlorosplenium**
 aeruginosum, De Not.
- Sphaerospora**
 trechispora, Sacc.
 asperior, Sacc.
- Erinella**
 apala, Mass.
- Lachnea**
 stercorea, Gill.
 scutellata, Gill.
 hemispherica, Gillet.
 bulbocrinita, Phil.
- Dasyscypha**
 virginea, Fckl.
 nivea, Mass.
 bicolor, Fckl.
 pulchella, Sacc.
 ciliaris, Sacc.
 aspidiicola, Sacc.
 hyalina, Mass.
 calycina, Fckl.
- Dasyscypha**
 canescens, Mass.
 calyculæformis, Rehm.
 clandestina, Fckl.
 sulfurea, Mass.
- Geopyxis**
 ammophila, Sacc.
 coccinea, Mass.
 cupularis, Sacc.
- Barlæa**
 Crouani, Mass.
- Humaria**
 humosa, Sacc.
 rutilans, Sacc.
 granulata, Sacc.
 violacea, Sacc.
 exidiiformis, Sacc.
 domestica, Mass.
 congreg, Karst.
- Peziza**
 vesiculosa, Bull.
 var. cerea, Rehm.
 reticulata, Grev.
 venosa, P.
 badia, P.
 saniosa, Schrad.
- Otidea**
 leporina, Fckl.
 cochleata, Fckl.
 onotica, Fckl.
 aurantia, Mass.
- Acetabula**
 vulgaris, Fckl.
- Helvella**
 crispa, F.
 lacunosa, Afzel.
- Leotia**
 lubrica, P.
- Mitrophora**
 gigas, Lev.
- Morchella**
 esculenta, P.
 elata, Fr.
 conica, P.
- Mitrula**
 phalloides, Chev.
 cucullata, Fr.
 viridis, Karst.
 olivacea, Sacc.
- Spathularia**
 clavata, Sacc.
- Vibrissea**
 truncorum, Fr.
 Guernisaci, Crouan.

Geoglossum
glabrum, P.
difforme, Fr.
hirsutum, P.

Fam. IV. PYRENOAMYCETES.

Podosphaera
clandestina, Lev.
myrtilina, Kze.

Sphaerotheca
pannosa, Lev.
castagnei, Lev.

Phyllactinia
guttata, Lev.

Uncinula
adunca, Lev.
bicornis, Lev.
Wallrothii, Lev.

Microsphaeria
berberidis, Lev.
grossulariæ, Lev.

Erysiphe
graminis, D.C.
martii, Lk.
communis, Schl.
lamprocarpa, Lev.
Montagnei, Lev.

Eurotium
herbariorum, Lk.

Asterina
veronicæ, Cke.

Tuber
æstivum, Vitt.

Fam. V. SPHÆRIACEÆ.

Nitschkia (*Sphaeria*)
tristis, Tode

Eutypa
lata, Tul.

Diatrype
disciformis, Fr.

Chætomium
comatum, Fr.

Rosellinia
thelena, Fr.
mammæformis, P.

Xylaria
hypoglossa, Grev.
corniformis, Fr.
carphophila, Fr.

Ustilina
vulgaris, Tul.

Hypoxylon
fuscum, Fr.
rubiginosum, Fr.
udum, P. (= *Sphaeria ordinata*).

Trichosphaeria
pilosa, P.

Sitgmatea
ranunculi, Fr.
ostruthii, Fr.

Gnomonia (*Sphaeria*)
setacea, P.

Bertia (*Sphaeria*)
moriformis, Tode.

Venturia
ilicifolia, Cke.

Leptosphaeria (*Sphaeria*)
acuta, Moug.
arundinacea, Sow.
culmifraga, Fr.

Melanomma (*Sphaeria*)
pulvis-pyrius, P.

Lasiosphaeria (*Sphaeria*)
hirsuta, Fr.

Zignoella (*Sphaeria*)
pulviscula, Curr.

Cucurbitaria
berberidis, Gray.
laburni, DeNot.

Polystigma
rubrum, P.

Hypomyces
cervinus, Tul.

Nectria
cinnabarina, Fr.
coccinea, P.
sanguinea, Fr.
peziza, Fr.
aquifolia, Bk.

Gibberella (*Nectria*)
pulicaris, Tul.

Claviceps
purpurea, Tul.
microcephala, Tul.

Cordyceps
militaris, Fr.

Epichloe
typhina, P.

Phyllachora
graminis, Fckl.

Dothidella ulmi, Fr.	Piggotia astroidea, B. & Br.
Rhopographus (Dothidea) filicinus, Fr.	gladioli, Pim.
Sphæria macrotricha, B. and Br.	Dinemasporium graminum.
botryosa, Fr.	Asteroma rosæ, D.C.
Fam. VI. SPHÆROPSIDÆÆ.	Septoria aceris, B. & Br.
Phoma asteriscus, Bull.	Glœosporium fructigenum, Bk.
Diplodia herbarum, Lev.	ficariæ, Bk.
Vermicularia dematium, Fr.	Coryneum Beijerinckii, Oud.

APPENDIX—MYCETOZOA.

Although not now included amongst Fungi, it seems desirable to include in this list such forms as have been met with in the Dublin District.

Physarum nutans, P. var. aureum, Grev. bulbiforme, Schum.	Licea cylindrica ?
Fuligo septica, Gm.	Amaurochæte (Reticularia) atra, Rost.
Leocarpus vernicosus, Lk.	Enteridium olivaceum, Ehr. (=Reticularia applanata).
Chondrioderma globosum, Rost. niveum Rost (=cyanescens) lucidum, Cooke.	Reticularia lycoperdon (=umbrina).
Didymium farinaceum, Fr. nigripes, Fr. var. xanthopus. effusum, Lk.	Trichia affinis, De By. aria, P. turbinata, With.
Spumaria alba, D.C.	Hemitrichia clavata, Rost.
Stemonitis fusca, Rost ferruginea, Ehr. ovata, P.	Arcyria punicea, P. incarnata, P.
Cribraria rufescens, P. (=intermedia). aurantiaca, Schrad.	Prototrichia flagellifera, B. & Br.
Dictydium umbilicatum, Schrad.	Lycogala miniatum, P. (=epidendrum).
	Ptychogaster albus ?

Monkstown, Co. Dublin.

LESSER BLACK-BACKED GULL, NESTING
IN CO. KILDARE.

BY J. E. PALMER.

IN his paper on the "Distribution of Birds breeding in Ireland," published by Mr. Ussher in the *Irish Naturalist* for March, 1897, the hitherto known breeding-localities of the Lesser Black-backed Gull were increased by the addition of Co. Westmeath. Co. Kildare may now be added.

For years I have thought it likely that these gulls nested in some of the large bogs in Kildare or King's County, having often seen them flying to and fro in the spring and summer months between the Dublin coast and Co. Kildare, generally following the river Liffey or the Grand Canal. It was not till last year that I got a clue to their inland haunt; and on visiting the locality—a very large bog—a few of the birds were to be seen, but I did not find where they were nesting. So to throw further light on the matter, on the 11th June I visited the place accompanied by Mr. Edward Williams. The bog is a wet one. It is a portion of that large part of the Bog of Allen lying between Edenderry and Rathangan. It is in Co. Kildare, not very far from the borders of King's County.

On crossing the bog to where I had before seen the Lesser Black-backed Gulls we visited a colony of several hundreds of Black-headed Gulls. When at a distance we saw several Lesser Black-backed Gulls on the wing among them, but these had disappeared when we got to the colony. Fortunately we turned our steps in what proved to be the right direction, for Mr. Williams soon caught sight of a number of Lesser Black-backed Gulls. They were scattered over the bog, standing on slight elevations, evidently keeping a look-out and watching us.

As we approached within a few hundred yards the birds gradually rose, and while we were in the vicinity of their nests they remained on the wing uttering their cackling alarm note which so closely resembles that of the Herring Gull. They kept at a greater distance from us than the Black-headed Gulls had done, and were less vociferous, and

altogether showed less anger at our intrusion. We estimated that there were about a hundred pairs when they were all on the wing. Their nesting colony was at a distance of something like half or three-quarters of a mile from that of the other gulls, and was at a rather less wet part of the bog.

The nests which we found—between twenty and thirty—were scattered over a fairly large area, perhaps fifty acres. They were all very similar. They were situated in slight hollows on little hillocks or mounds of bog where Ling and Bent-grass were growing rather scantily. They were well above the then water-level. They were composed chiefly of moss (several kinds), some dried grass, with here and there a little Ling and Bog-cotton. They were solid, well constructed nests, about two inches in thickness, and about a foot in diameter. One contained four eggs; two others three each; and another, one egg. Most of the eggs were nearly ready for hatching. Other nests contained young birds in various stages of growth, some of which Mr. Williams took for preservation. A few young birds, in drab down spotted with black, were on the ground away from their nests, but unable to fly.

In the case of both species of gulls here referred to we were struck with the very small number of young birds to be seen in proportion to the number of old birds. They could hardly have been hiding, for there was scarcely enough cover to hide them effectually; and it was evident that hatching was over except in a few belated cases. The cause of this scarcity of young birds is rather puzzling; there has not been either drought or prolonged wet weather. Rats sometimes do great mischief among young ducks, but evidence was not apparent of their having attacked the young gulls, or of their presence. Whether the usual food supplies have been deficient is not very apparent. Lesser Black-backed Gulls are destructive to various young birds; but if they were in the habit of preying on the young of their congeners the Black-headed Gulls it might be supposed that the latter would have deserted the neighbourhood. Both species, I understand from local informants, have been nesting at their present colonies for years.

THE IRISH FRESHWATER LEECHES.

BY R. F. SCHARFF, PH.D.

LEECHES are closely allied to earthworms, but they are readily distinguished from the latter by their oval contour and flattened shape, and by the possession of two suckers, one at each end of the body. There are also anatomical differences which I need not dwell upon, as by the characters mentioned, all the Irish leeches can be at once identified as such.

Not all the Irish leeches inhabit fresh water ; some live in the sea, and to these I may, perhaps, refer on another occasion. The Common Horse-leech is frequently found under stones in damp situations, occasionally far removed from a pond or stream. It might, therefore, be looked upon as a land-leech, however, its usual habitat is the water, and it will never move to a place which does not provide it with a more or less constant supply of moisture necessary for its comfort. Real land-leeches exist, but these are mostly confined to the tropics, and are fortunately absent from Ireland.

The word "leech" not being now used to denote a medical man, at once suggests to the popular mind a ferocious blood-sucking animal. Only the Medicinal Leech, however, is capable of piercing the human skin, whilst the Horse-leech, which is so commonly met with in Ireland, is perfectly harmless. The Irish freshwater leeches may be conveniently divided into two groups, viz., *Rhynchobdellæ* and *Gnathobdellæ*. The first of these include the smaller leeches which are unprovided with jaws and possess an exsertile snout or proboscis. Their blood is colourless. All the snail-leeches belong to this group, so-called because they suck the blood of water-snails and other aquatic animals. Though unprovided with jaws, the muscular proboscis can be pushed through the tissues of the victim and the nourishing juices pumped out.

All leeches with red blood and without a proboscis belong to the other group the *Gnathobdellæ*. As a rule these possess jaws—all the Irish species at any rate do but in England a gnathobdellous leech exists, viz., *Trocheta viridis*, in which

they are absent. In 1878, Mr. Templeton published a paper on *Aulastoma heluo* (7), and I wrote a short note on Irish leeches in the *Irish Naturalist* (vol. iv., 1895), but nothing else has appeared in print on this group since 'Thompson' "Natural History of Ireland" (vol. iv.) was issued in 1856.

Ten species of freshwater leeches were recorded by the latter as Irish, viz. :—

Erpobdella tessulata.

Glossiphonia eachana.

E. vulgaris.

Piscicola geometra.

Glossipora tuberculata.

P. perca.

G. hyalina.

Haemopsis vorax.

G. bioculata.

Hirudo medicinalis.

with the addition of Templeton's *A. heluo*, this brings the number up to eleven.

Owing to the fact that some authors have described new species of leeches merely from differences in colour, and that these are now recognised as colour-variations of species which had been known previously, a good many of these will have to be withdrawn. Mr. Templeton has founded a few species on characters which are now regarded as insufficient to distinguish them. Thus Dr. Apathy remarks (1., p. 779), that Templeton's *Piscicola perca* is clearly *Piscicola piscium* (= *geometra*, L.). Moreover, Dr. Blanchard tells me that he has examined Templeton's type of *Aulastoma heluo* in the British Museum, and is convinced of its being identical with the common continental horse-leech (*Hæmopsis sanguisuga*). He also feels certain that Thompson's *Glossiphonia eachana* is nothing but the *Gl. tessellata* (Müll.). The eleven Irish species are thus reduced to eight. The nomenclature of most of these has to be somewhat altered, so as to bring them into agreement with our modern requirements of priority.

In the determination of the freshwater leeches the position and number of the eyes are of considerable importance, and to facilitate determination a diagrammatic figure of the head is given. These are, like those of many other invertebrates, of a very rudimentary nature. Leeches cannot probably do more than distinguish light from darkness by means of them.

The Medicinal leech and the Horse-leech deposit their eggs in cocoons, whilst the snail-leeches fix their eggs to the ventral surface of their parents' body. There they are hatched, and the young cling to the parent for some time afterwards by means of their posterior suckers.

I have been liberally supplied with specimens of Irish freshwater leeches, especially by the Right Hon. Lord Clonbrock, Messrs. C. Langham, R. Welch, H. L. Jameson, J. N. Halbert and others, and by the Royal Irish Academy Fauna and Flora Committee. All these specimens are now in the natural history collections of the Dublin Science and Art Museum. Mr. H. L. Jameson assisted me very materially in drawing up this account of the Irish freshwater leeches by writing out a complete catalogue of the specimens contained in our Museum collection.

The following is a list of the more important papers and books referred to, some of which deal with the Irish freshwater leeches. These will be referred in the text by their numbers:—

1. APATHY, S., Süsswasser-Hirudineen, *Zool. Jahrbücher (Abth. f. syst.)* vol. iii., 1888.
2. BLANCHARD, R., Hirudinées de l'Italie. *Boll. Mus. Torino*, vol. 9, 1894.
3. HOUGHTON, W., Remarks on the Glossiphoniidæ, *Quart. J. Mier. Science*, vol. i. (N.S.), 1861.
4. — "Snail Leeches," with a monograph of the Brit. species. *Intellectual Observer*, vol. viii. 1865.
5. JOHNSTON, G., A Catalogue of the British Non-parasital Worms in the British Museum, 1865.
6. MOQUIN-TANDON, A., Monographie de la famille des Hirudinées, Paris, 1846.
7. TEMPLER, R., Observations on *Aulostoma heluo*. *Ann. and Mag. Nat. Hist.* (5) vol. viii., 1878.
8. THOMPSON, W., Natural History of Ireland, vol. 4, 1856.
9. — Additions to the Fauna of Ireland. *Ann. and Mag. Nat. Hist.* (1.) vol. xviii.

RHYNCHOBDELLÆ.

FAMILY ICTHYOBDELLIDÆ.

Piscicola geometra (L.)

In this species as in all the members of the family, the body is constricted in front, and the two suckers are almost separated from the body. The latter are large and cup-shaped, the posterior larger than the anterior. There are four eyes situated on the anterior sucker. It is flesh-coloured

or white underneath and greenish grey above with a narrow median light stripe. This leech, which swims well, is parasitic on freshwater fishes, principally the Perch.



I have already mentioned that *P. perca* of Templeton must be looked upon as a variety of this species. According to Thompson, it has only been obtained in the North of Ireland. The only southern locality known is the River Dodder (county Dublin) where the Dublin Museum specimen was obtained by Mr. William Boshell parasitic on a Gudgeon (*Gobio fluviatilis*).

FAMILY GLOSSIPHONIDÆ.

Glossiphonia stagnalis (L.)

Glossipora bioculata, Thomps.

The members of the family *Glossiphoniidæ* are distinguished from the *Ichthyobdellidæ* by having the anterior sucker fused with the body. They all live in fresh water, certain species occurring in every pond or brook. From the fact that some of them live parasitically on water-snails, they have been spoken of as snail-leeches, and as such they form the subject of a most interesting article by the Rev. W. Houghton (4). Owing to the transparency of their bodies, many of the species are particularly suitable for the study of the structure and internal anatomy of leeches.



Mr. Houghton gives a figure of *G. stagnalis* (4. fig. 7-9), but we find a better one in Moquin-Tandon's work (6. pl. xiii. fig. 16-26). The two eyes are plainly visible with a lens. They distinguish the species at once from all other Irish forms. This species is very quick in its movements, either rapidly progressing like a looper caterpillar or swinging to and fro attached by the posterior sucker. It is flesh-coloured or light grey with brown or reddish dots, and grows to the length of about 10 mm., which is less than half an inch.

Thompson has recorded the species from Lough Neagh (8). We possess specimens in the Dublin Museum from Co. Antrim (H. L. Jameson); from Co. Fermanagh (C. Langham); and from Co. Dublin (R. F. Scharff).

Glossiphonia heteroclita (L.)

Glossipora hyalina, Thomps.

The six eyes are arranged in such a manner that without a strong lens only three are visible. The Rev. Houghton describes the species as



being the most transparent of the family (4). The general colour is a

pale amber, or orange. The gastric cæca are frequently visible with the naked eye owing to the transparency of the body, especially as they become of a bright vermilion colour after the leech has fed. The back is sprinkled with numerous minute, brownish spots, sometimes arranged in lines. It rarely exceeds half an inch in length. This species is very inactive and rolls itself partly up when handled.

Thompson records this leech from the neighbourhood of Belfast, I have taken it at Clonbrock (Co. Galway) and Mr. Langham has found it at Tempo (Fermanagh).

Glossiphonia complanata (L.)

Glossipora tuberculata, Thomps.

This species agrees with *G. heteroclita* in the possession of six eyes, but it is less transparent than the last. Its colour is very variable—as a rule it is greenish or brownish. *G. complanata* may be distinguished from *G. heteroclita* by its tubercles which are in rows. Two very distinct rows of dark papillæ run down the middle of the back. It grows to a length of about an inch.



This is one of the commonest species and has been collected at Dingle and Ventry, Co. Kerry (F. & F. Comm.); at Tempo, Co. Fermanagh (C. Langham); Clonbrock, Co. Galway (Scharff); Cashel, Co. Tipperary (Miss Kelsall); Lough Neagh and Coleraine (Thompson); Holywood and Belfast (Templeton); Downpatrick (R. Welch). In the County Dublin I have found it in almost every pond and ditch.

Hemiclepsia tessellata (Müll.)

Erypobdella tessulata, Thomps.

According to Dr. Blanchard, Thompson's *Glossiphonia Eachana* (S, p. 425) is probably only a variety of this species. It is the largest and most active of the *Glossiphoniidae*. It may be at once recognised by its large posterior sucker which is provided all round the margin with light spots. Similarly, spots are found along the margin of the body which is greenish or brownish in colour with 2-6 series of yellow markings along the back. Many colour variations occur. It grows up to a length of 2 inches and there are always 8 eyes.



This leech is rare in Europe according to Dr. Blanchard, and this agrees with my experience in Ireland, where it has only been obtained in a few localities, viz., Lough Neagh (Thomps.); Clonbrock (Scharff); Santry, Co. Dublin (Halbert); Glenomeragh, Co. Clare (F. and F. C.)

GNATHOBDELLÆ.**FAMILY GNATHOBDELLIDÆ.**

The members of the family *Gnathobdellidæ* have a gullet provided with three toothed jaws.

***Hirudo medicinalis*, L.**

The common Medicinal Leech lives in ditches, ponds, and slow-flowing rivers. It grows to a length of 4 inches. There are very numerous colour variations, but as a rule the back is olive-coloured and marked with 6 brown lines. I have never seen an Irish Medicinal Leech, and my efforts to get a specimen have hitherto proved



fruitless, but O'Flaherty in his "West or H-Jar Connaught" refers to them (they are called *dallo*g in Irish) as being common on the south side of Lough Mask in 1684, and the late Sir W. Wilde stated that in 1849 it was still found in pools and wells in the vicinity of the same lake. He also mentioned that in summer the leech-gatherers sat with their legs in the water on which the creatures fasten and are thus obtained.

***Hæmopsis sanguisuga* (L.).**

Hæmopsis vorax, Thomps. (= *H. heluo*, Templ.)

The Horse-leech (*H. sanguisuga*) agrees with the Medicinal Leech in possessing ten eyes, and some varieties of the latter resemble it so much that it sometimes becomes difficult from external characters to decide which species a specimen belongs to. In such a case we must observe the animal when at rest. Whilst the true leech is able to contract itself into an oval, *olive-shaped form*, the horse-leech does not possess that power. As a rule, however, the brown longitudinal lines on the back distinguish the true leech from the Horse-leech, which is generally uniformly greenish or spotted with black.



The teeth of this leech are unable to pierce the human skin or that of the higher vertebrates generally, though it occasionally penetrates into the nostrils of horses and cattle. Its usual food consists of worms, larvae of insects, and tadpoles, whose juices it sucks up.

The Horse-leech is common throughout Ireland.

FAMILY HERPOBDELLIDÆ.

Herpobdella octoculata (L.)*Erpobdella vulgaris*, Thomps.

This species bears a certain external resemblance to *Hemiclepsis tessellata* and like it has eight eyes, but there are some fundamental differences. It differs from the latter and agrees with the true leech and Horse-leech in being devoid of a proboscis and in having red blood. Its eggs are deposited in a cocoon, whilst all the *Glossiphoniidae* fix theirs on to the ventral surface of the body.



The colour of this species is somewhat variable. Those I have seen were greenish-red or blackish, but it may also be of a yellowish colour, and it generally has a series of dark cross lines all along the back. It swims well, whilst *Hemiclepsis tessellata* only creeps like a large caterpillar. Mr. Thompson describes it as being "merry as a grig."

This species is recorded by Thompson from Lough Neagh and from Phoenix Park, Dublin. It also has been taken in the County Antrim and Rathlin Island (H. L. Jameson); at Tempo, Co. Fermanagh (C. Langham); at Mote Park, Co. Roscommon (F. and F. Comm.); and at Downpatrick (R. Welch).

[A green land-leech (*Trocheta subviridis*) growing to a length of six or seven inches and belonging to this family occurs in the south of England and may possibly also be a native of this country.]

Science and Art Museum, Dublin.

COUNTY AND VICE-COUNTY DIVISIONS OF THE BRITISH ISLES.

Mr. A. Somerville, of Glasgow, has favoured us with a copy of a very useful sheet which he has drawn up enumerating the 112 divisions of Great Britain adopted in Watson's "Topographical Botany," and the 40 divisions of Ireland lately suggested by R. Lloyd Praeger, and giving geographical notes as to their boundaries. The sheet has been issued after consultation with a number of naturalists in the three Kingdoms, and it will prove of great service to all engaged in tracing the distribution of any group of plants and animals. We cannot help thinking, however, that it is inconveniently large, and would have been much handier for use if printed as an eight-page pamphlet. Copies may be obtained (4*d.* each, three for 8*d.*) from Mr. A. C. Burns, 383, Sauchiehall Street, Glasgow.

NEW IRISH ANNELIDS.

BY REV. HILDERIC FRIEND.

I have received from Dr. Trumbull, of Malahide, an interesting consignment of worms which contains a species that proves to be not only new to Ireland, but new to science. I have so far hesitated to describe it because I did not wish to introduce any new names into our already congested lists if I could in any way avoid it. Continued research, however, leads me to the clear conviction that the worm I am about to describe has never yet received a name, and in the interests of science I am compelled to set forth its characteristics. It belongs to the Enchytræids, a large family of worms which are usually white or pallid, though there are two genera at least with coloured blood. The worm has been called *ulmicola*, because it was found within the decaying wood of an elm tree. As the main peculiarity relates to the shape of the spermathecæ, I add a representation of one of these organs, and also of the brain lobes and setæ.

***Fridericia ulmicola*, n.sp.**

A small white worm about $\frac{3}{4}$ -in. in length; number of segments, 60. Setæ, four to six per bundle in front, the inner ones shortest; four in posterior portion of body, of almost equal length, setæ hooked internally; the short hook being bent almost round to a right angle with the shaft. A couple of setæ on segment 8 widely separated. Brain of two lobes, almost egg-shaped, attached to the body-walls by strong muscular processes. The spermathecæ in segment 5, with three distinct diverticula, the blind extremities of a decided brown colour. Salivary glands branched. Girdle composed of about 30 rows of cells. Habitat: old, decaying elm. Dr. Trumbull. Malahide, April 1st, 1896.

A word may be added with regard to the affinities of the species. Up till the present quite a score or more of *Fridericias* have been admitted into the lists. Of these Beddard (*Monograph of Oligochæta*) describes exactly a dozen species. One of these (*F. callosa*, Eisen) has four setæ in a bundle; and "spermathecæ with three *indistinct* diverticula." The anterior as well as the posterior margin of the brain is convex. Beddard aptly remarks that the spermathecæ are intermediate in their character between those without any diverticulum, and the more differentiated species. *F. bisetosa*, *F. Leydigii*, and *F. Perrieri*, each of which has spermathecæ with two diverticula, while in *F. galba* there are four. Thus our new species fills the gap between *Perrieri* and *galba*. So far as I am aware neither of these has been hitherto recorded for Great Britain, but I have

discovered *Fridericia Perrieri* (Vejl.) near Cockermouth, in Cumberland; and *F. galba* (Hoffm.) has reached me from various parts of England, as well as from Ireland. As the latter has not yet been described in the *Irish Naturalist*, I append a brief diagnosis drawn from the *Monograph* of Beddard.

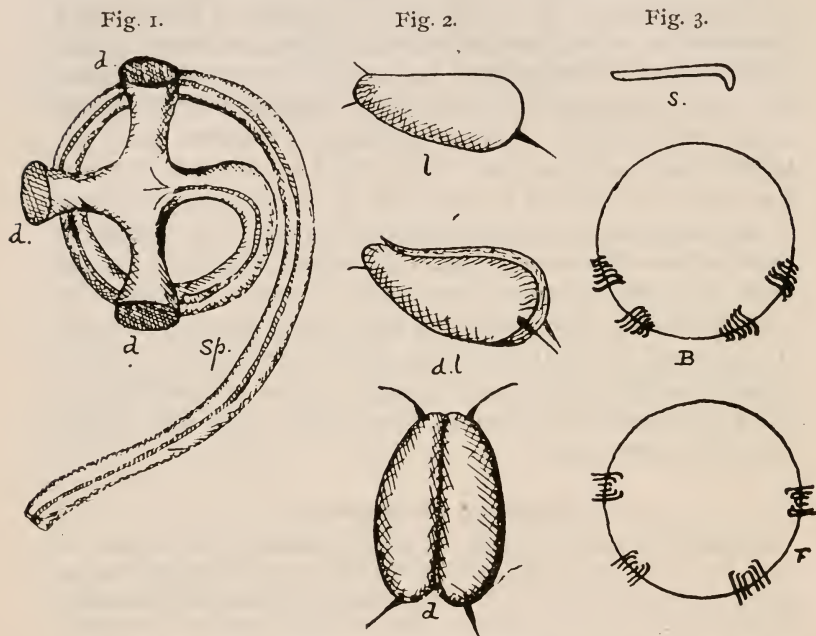


Fig. 1. Spermatheca of *Fridericia ulmicola*, Friend, *d.*, diverticula.

Fig. 2. Brain of same, *l.* lateral, *d.l.* dorso-lateral, *d.* dorsal view, with muscular attachments.

Fig. 3. *s.* seta of same. *B.* Diagrammatic plan of setæ in front portion of *Buchholzia fallax*. *F.* Diagram of front portion of *F. ulmicola*.

***Fridericia galba* (Hoffmeister)**

Length, 20 mm.; number of segments, 50; setæ, 4.6 per bundle; at posterior end all setæ of a bundle equally long. Anteseptal part of nephridia long and broad, with contorted duct. Spermathecae with four stalked diverticula. The brain is twice as long as broad, with a slightly convex hinder margin. The salivary glands are branched posteriorly.

Specimens of this worm were received from Murlock Wood, July, 1897, through the kind offices of Dr. Trumbull. On August 1st, 1896, I also received specimens from Mr. Hart, of Howth, which I assign to this species, although the diverticula were not stalked, and one was a great deal larger than the rest. The setæ were six in a bundle in front, and four behind. Either these various species are subject to wide differences in details, or we have yet a great deal to do to analyse them and fix their permanent characters. One difficulty which meets the student is due to the fact that many book-descriptions are based upon characters drawn from material which had been preserved—often very indifferently—whereas the appearance of the living worm is totally different. There is almost as much difference between a living worm and one kept for a time in preservatives, as between a living nautilus and a fossil ammonite. Beddard has truly said that what is needed is the full and careful study of living material.

***Buchholzia fallax*, Michaelsen.**

“DEFINITION. Length 10 mm.; setæ, 4-6 per bundle of different lengths. Sexual organs occupying the usual situations [unlike *B. appendiculatus*]; spermathecae with diverticula near to distal swollen extremity, two large glands at external pore.” Beddard, *Monograph*, 334.

I found this interesting worm on the shores of Lough Neagh, June, 1896, and have also taken it in Cumberland at Lodore and Lowther. In some of my specimens I find unpaired internal glands in those segments, which, according to Michaelsen, produce papillæ having the appearance of outgrowths of the epidermis, or imperforate penes. To fully understand the structure of these minute, but complicated, creatures it is necessary to study fresh material collected at different seasons of the year, as the appearances at one season vary greatly from those of another, according as the worm reaches maturity, or otherwise.

I have not the good fortune to possess the memoir in which Michaelsen describes the species under review, but Beddard points out that “the setæ of each bundle are of unequal sizes, and are so arranged that the longest setæ of the ventral bundles come nearest to the longest setæ of the lateral bundles.” This will be best understood by reference to the diagram. I may, however, point out that, so far as my observation goes, the setæ in the posterior portion of the body, as in many *Fridericias*, are practically equal in length, while those in the anterior, as in *Fridericias* also, are unequal. There are usually four setæ in each bundle posteriorly, and six in the anterior portion of the body.

Ocker Hill, Tipton, Staffordshire.

PROCEEDINGS OF IRISH SOCIETIES.

ROYAL ZOOLOGICAL SOCIETY.

Recent gifts include five Choughs from Sergt. M'Goldrick, a pair of Long-eared Owls from Messrs. C. and S. Ross, a pair of Red-breasted Mergansers from Mrs. Rathborne, a Civet Cat, two Sooty Monkeys, two Crown Cranes, two Touracoos, a Kite and a Royal Python from Mr. Justice Smyly, and five Seagulls from Mr. Justice Boyd. Four Choughs and five Cormorants have been bought.

Over 15,000 persons visited the Gardens in June.

NOTES.

BOTANY.

PHANEROGAMS.

Medicago maculata In Co. Wicklow.

A large patch of this rare colonist occurs in a small field adjoining Rathnew Station, Co. Wicklow. It forms a mass, two or three square yards in extent, completely exterminating the grass, and is so marked as to be readily seen from the train. The station-master informs me it has been there for several years. It is probably not native anywhere in Ireland, and even as a colonist is only recorded in the *Cybele Hibernica* from one or two districts. The plant was brought under my notice by a friend, and I have not had an opportunity of observing whether it has spread to any distance, or is confined only to its own patch.

GREENWOOD PIM.

Monkstown, Co. Dublin.

Teesdalia nudicaulis In North-east of Ireland.

In June of the present year I had the gratification of detecting this Crucifer growing amongst others—*Cardamine hirsuta* and *Capsella Bursa-pastoris*—at the side of a field bordering on the Lagan Canal at Glenmore, near Lisburn, Co. Antrim. The plant was first recognised in Ireland by Mrs. Leebody in June, 1896, at Washing Bay on Lough Neagh, Co. Tyrone; the only Irish locality for which it has hitherto been recorded. (Præger in *Ir. Nat.*, vol. v., p. 212.) Whether accepted as a true native in that place I am not aware; but the British distribution of *Teesdalia*, occurring as it does in sixty-seven of the counties and vice-counties of Watson's "Topographical Botany," is such as would lead us to expect it in Ireland. At Glenmore it seems likely that it may have been a casual introduction, and that from its County Tyrone station, inasmuch as at the spot where it occurs there was discharged,

several years ago, a cargo of Lough Neagh sand, which, it was alleged by the master of the lighter from whom it was purchased, had been brought from Washing Bay. If my conjecture as to its origin be correct, as would appear highly probable, the plant must have been established here for some six or seven years; and it may now be anticipated that it will abide and spread.

J. H. DAVIES.

Lisburn.

***Geranium pratense* In Co. Armagh.**

On the 17th of June some fine plants of *Geranium pratense* were found near Armagh. Is this a new locality, or has it been reported from other counties besides Antrim?

Rathdrum.

D. M. P. NEWTON.

[I found *G. pratense* at this station some years ago, but never entertained any doubt that it was a garden escape, as it is in several other wild-looking stations that might be named.—R. LLOYD PRAEGER.]

***Pinguicula* In Co. Wicklow.**

Amongst the Wicklow mountains south of Lugnaquilla, a large type of *Pinguicula vulgaris* grows freely beside the ordinary specimens. It is well marked by larger flowers, a thick bifid spur and more luxuriant growth. Can this be *P. grandiflora*?

Rathdrum.

D. M. P. NEWTON.

[If Miss Newton will send us specimens we shall be glad to examine them. But the occurrence of *P. grandiflora* in Co. Wicklow is more than unlikely.—EDS.]

ZOOLOGY.

MOLLUSCS.

***Paludetrina Jenkinsi*, Smith, var. minor, nov. In South Ireland.**

Mr. R. Welch of Belfast has again made a most interesting conchological discovery. While at Kenmare in May he came upon a colony of the above species, all the individuals of which are of a dwarf form, the largest measuring not more than 3.5 mm. in altitude, whereas the type measures 5–25 mm. This minor form is new to science. So far all the specimens from Kenmare are uncarinated, though this may not prove universal when the colony is more thoroughly explored. The exact locality is at Roughty Bridge, in a little stream of fresh water above high-water mark. It appears that Baltic timber was imported here till twenty years ago.

Stafford.

LIONEL E. ADAMS.

BIRDS.

The Stock Dove In County Wicklow.

It may interest your correspondent (Mr. R. M. Miller) and others to learn that in my opinion this bird is evidently increasing its breeding range in this country. Ten years ago there was no Irish specimen in our National Museum, now there are several; about that time I shot and recorded a specimen obtained in August at Kilcool, County Wicklow; the following year a pair were found breeding at Powerscourt Waterfall. Since then it has become more plentiful, and this year I can record it as breeding in the following places:—Wicklow Head, Newcastle, Lough Dan, Luggala, Powerscourt, and Sugarloaf. The nests in every case being either placed in rabbit-holes or cliffs, or in fissures in the rocks.

Trinity College, Dublin,

F. BLAKE KNOX.

Grouse Disease In Ireland.

I would be greatly obliged for specimens, or information that might lead me to obtain specimens, of fresh grouse picked up on the hills, and supposed to have died from the so-called grouse disease, for *post-mortem* examination.

Pathological Laboratory,
Trinity College, Dublin.

F. BLAKE KNOX.

The Nightjar In Co. Mayo.

This bird of the night (*Caprimulgus europæus*) was heard at Blacksod Bay on 10th June and identified. As it is by no means a common bird, its appearance so far west may be worth noting.

Galway.

R. M. GILMORE.

Iceland Gull In Co. Sligo In Summer.

On the 18th inst., when driving from Enniscrone to Oghill, about ten miles from the sea, I passed by a field that was being prepared for turnip sowing, and to my great surprise amongst a flock of about twenty immature Herring Gulls, I perceived an Iceland Gull. The bird as usual was very tame, feeding within three or four yards of the man and horses, and as it fed, within about ten yards of the road where I was standing, I had an excellent opportunity of observing it with my glass.

It appeared to be a bird of last year, for although the head and neck was very light coloured, the shoulders and back were rather dark, so probably the bird would not exhibit its creamy stage of plumage until after this autumn's moult. The occurrence of the Iceland Gull in summer is very unusual, and the only other occasion on which it has been observed in this country, was on the 5th of June, 1896, when an adult specimen was found dead on the sands of Mullaghmore, by Mr. C. Langham, of Tempo Manor, Co. Fermanagh.

Moyview, Ballina.

ROBERT WARREN.



ICE-ROUNDED BLUFF OF OLD RED SANDSTONE AT LOO BRIDGE.

[R. Welch, Photo.]

To face p. 201.]

IRISH FIELD CLUB UNION.

REPORT OF THE SECOND TRIENNIAL CONFERENCE AND EXCURSION, HELD AT KENMARE, JULY 7TH TO 13TH, 1898.

I.—GENERAL ACCOUNT.

BY R. LLOYD PRAEGER, B.E.,
Secretary, Irish Field Club Union.

KENMARE was selected by the Field Club Union Committee as the centre for the second large gathering of the Irish Field Clubs on account of its excellent position from a biological point of view, lying as it does at the head of a long arm of the sea between two of the great mountain-ribs of Kerry, the most interesting county in Ireland to the naturalist. This place possessed, moreover, the important advantage of a spacious hotel, wherein all the members might be housed together, avoiding the inconvenience of any splitting-up of the party. The scientific results of the trip, and the ease with which the party were able to reach the best ground in the district, show that the choice of a centre was wisely made; nor must the ease with which Kenmare is reached from Dublin be left out of account.

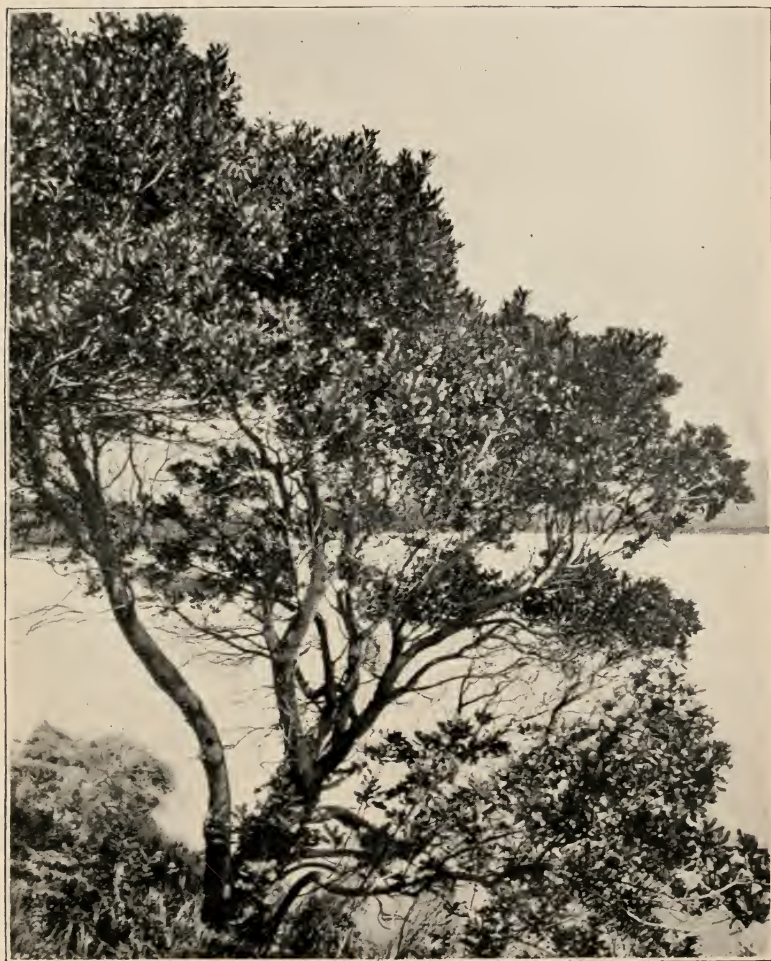
THURSDAY, JULY 7th.—The Belfast section of the party, in number about 40, took the 7.30 a.m. express for Dublin, and in the afternoon were joined at Kingsbridge station by the Dublin members and the English contingent, when all took the Killarney express at 2.20, in a train of carriages reserved for the members of the party. Save for a brief halt at Ballybrophy for water, no stop was made till Mallow was reached—147 miles in five minutes under three hours. Here the Limerick contingent joined the party, the Cork members having gone on by an earlier train. The tedium of the journey was beguiled by studying the country through which the train rapidly passed—the great limestone plain, broken up by ridges of Old Red Sandstone and Silurian rocks. The geology of the journey was made amply clear by means of a map by Mr. J. Porter, B.E., showing the distribution of the various formations along the line of route, copies of which were distributed, supplemented by the description of the district by Prof. Cole, which appeared in the programme. At Headford Junction the special carriages were uncoupled from the Killarney train, and a short and highly picturesque run through steep rocky wooded hills brought the party to Kenmare, where they were joined by the Cork members and by various stragglers who had come down in advance, and all were soon esconced in the Southern Hotel, the most accessible of the four houses which the Southern Hotels Co., Ltd., have recently erected on the beautiful coast

of Kerry. The situation of the hotel is a fine one, standing as it does in its own grounds on an eminence overlooking the head of the great sea-inlet called Kenmare River, with the little town close at hand at its rear, cut off by a grove of trees.

FRIDAY, JULY 8th.—Breakfast was punctually at 8.0, and shortly after 9.0 the entire party were on the road for Cloonee, a ten-mile drive. The route lay across the suspension bridge to the southern side of the inlet, and straight down the shore. The weather was perfect, with light fleecy clouds drifting over the high summits of the Reeks, which towered up magnificently to the westward. No stop was made till Cloonee was reached, and an encampment was made on a heathy knoll between the Middle and Upper Lake. Then the party scattered wide over the valley and lake-sides and hills, pursuing their various bents. The lake-bottom and islands were explored by means of boats. All met at 2.0 for lunch, only to scatter again until the Secretary's whistle at 5.30 warned stragglers that the time for departure had come. The day's work proved satisfactory. The heathery slopes, swamps and bog-holes, cliffs and woods, the lake-shores, and islands clothed with dense thickets of Oak, Birch, Holly, Willow, Arbutus, and Yew, all yielded their harvest to the collector. The best finds included the beetle *Paracymus nigroaeneus*, new to Ireland, and the large skater *Gerris najas* amongst the Hemiptera, and among plants *Sisyrinchium angustifolium*, *Bartsia viscosa*, etc.

In the evening the centre of attraction was two small sitting-rooms which were specially set apart for scientific work, and here until a late hour setting-boards, forceps, killing bottles, vasculums and plant-presses reigned supreme.

SATURDAY, JULY 9th.—A punctual start was made at 9.0 a.m. for the Upper Lake of Killarney, in weather as cloudless as the previous day. The route northward lay up the valley of the Finnihy River, ascending steadily all the while, with the high mass of Boughil (2,063 feet) rising on the left. Passing through Moll's Gap, a cutting through splendidly ice-rounded rocks at the summit (800 feet), a grand view was obtained—the deep valley of Owenreagh River in front, with a ridge of brown mountains on the further side, over whose summits MacGillycuddy's Reeks towered in glorious array, clear except for a little cloud cap on Carrantuohill (3,414 feet), the highest point of Ireland. To the right rose Purple Mountain, the Gap of Dunloe separating it from the Reeks; and further to the right Torc Mountain lay in a blue haze. A rapid drive along the steep slopes of Derrygarraff and Foardall, and past Looscannagh Lough brought the party to the woods that overlook the beautiful Upper Lake of Killarney, and here under a shady oak-tree, the Secretary sounded a halt, and the party quickly scattered through the woods and rocks. The heat was intense, but not enough to deter the naturalists from steadily pursuing their researches. Lunch in the shade proved very grateful, after which further explorations were carried out. One of the best beetles found in this district was the beautiful *Donacia dentata*, and the rare *Lissodema quadripustulata* was beaten from Oak on the shore of the lake.



STRAWBERRY-TREE (*Arbutus Unedo*) on island in Cloonee Lake.

To face p. 202.]

[*R. Welch, Photo.*



To face p. 203.

AT CLOONEE LOUGH.

[*R. Welch, Photo.*]

At 5.0 p.m. a start was made for home, and the whole party sat down to dinner at 8.0.

After dinner a brief conference was held on the occasion of the second gathering together of all the Field Clubs of Ireland.

FRANCIS JOSEPH BIGGER, M.R.I.A., rising, said it fell to him as Vice-President of the Belfast Naturalists' Field Club to take the chair on this occasion, in the absence of Rev. C. H. Waddell, the President of the senior Society. This was the second triennial conference that the Irish Field Clubs had held, the first having been at Galway in 1895. It was gratifying to see on this occasion many faces that had become familiar at Galway, and equally pleasant to see here many new faces. He called on the Secretary of the Union to make a statement.

R. LLOYD PRAEGER, B.E., M.R.I.A., President of the Dublin Naturalists' Field Club and Secretary of the Irish Field Club Union, said he hoped he might be permitted to refer briefly to the history of the Union under whose auspices they now met, and to state what work the Union had been doing since their last Conference. Having referred to the origin of the Union, which had been duly recorded at their last meeting (see *Irish Naturalist*, 1895, p. 225) he said that the work of the Union in arranging for interchanges of lecturers between the various Clubs during the winter sessions, and for the loan of diagrams, lantern-slides, &c., had been steadily carried out, and he thought all the Clubs had benefited by these arrangements. Things had gone smoothly and he hoped successfully.

At the present Conference members would, he did not doubt, be glad to hear that no official business required their consideration, and the meeting was held chiefly in order to give Field Club members an opportunity of bringing forward any suggestion they might have to make regarding the extension of Field Club work in Ireland, or the improvement or development of the existing inter-Club arrangements.

W. A. FOGERTY, M.A., M.D., President of the Limerick Naturalists' Field Club, expressed the pleasure it gave him and the fellow-members who were with him to be present on this excursion. Their Club, which was now six years old, had benefited materially from the formation of the Field Club Union. They had had lectures from a number of the leading members of the Dublin and Belfast Clubs, and had received valuable assistance in many ways. Owing to the recent inclusion of archæology in the scope of the Club work, the membership had recently largely increased, and now numbered 260 (applause). The only suggestion he had to offer was that, if the season at which these joint meetings were held could be varied occasionally, it might result in the finding of fresh plants and animals.

WM. HUMBLE JOHNSON, Secretary of the Cork Naturalist's Field Club, regretted the absence of Mr. J. L. Copeman, President of that Society, as owing to his recent accession to the Secretaryship, he hardly felt competent to speak on the relations between his Club and the other Field Clubs and the Union. But he joined with previous speakers in testifying to the material benefit that the Union had been to his Society.

W. H. PATTERSON, B.N.F.C., said, that as suggestions had been invited, he rose to make one. It was, that a list of all members and visitors attending a meeting such as this, should be posted in a conspicuous position—more than that, he would suggest that a badge showing at least the Club to which each member belonged, should be worn in some conspicuous place—a blue badge for instance for Belfast members, a green badge for their English conchological friends (laughter) and so on. There were present on this excursion many members whom others knew well by name, but among so large a party there was a practical difficulty about identification.

The CHAIRMAN called for other remarks or suggestions, and, there being no response, he said that would be taken as an expression of approval of the present management of Union affairs, and he declared the meeting terminated.

SUNDAY, JULY 10th.—The programme left members free on this day, and the morning furnished a welcome respite from early starts in a broiling sun. During the early part of the day the sun shone with a fierce heat rarely experienced in Ireland, but in the afternoon a fresh cool breeze sprang up, and a large section of the party started on cars at 2.30 to visit some local objects of interest. Taking the Kilgarvan Road, the old Church of Killowen was passed, and a small cromleac and several gallauns hard by were inspected. Near Cleady a grassy lane bright with *Bartsia viscosa* led to Carrigacappeen, one of the most remarkable erratic blocks in Ireland—a 30-ton boulder of Old Red Sandstone, perched on the top of a 6-foot pillar of Carboniferous Limestone. Turning southward now, the Roughty River was crossed by a picturesque bridge, and the very rare shell, *Paludestrina Jenkinsi*, was collected in the spot where it had been discovered by Mr. Welch two months before. Leaving the brakes and cars, the party now ascended a steep hill to where Cloghvorragh stands perched above the valley—a huge block of Carboniferous Limestone, estimated to weigh 400 tons, resting on Old Red Sandstone at an elevation of 250 feet. From this point a very fine view down the Kenmare River was obtained. Members then pushed on eastward for a mile and inspected a group of three standing stones, on one of which an ogam inscription appears. A drive along the sea-edge brought the party to Slieen Bridge, where the Sheen River tumbles over reefs of slate and sandstone into the clear sea-water, and a pleasant hour was spent at this pretty spot. The old Church of Kenmare, which adjoins, was next inspected, and the holy well of St. Finan, down on the sea-shore. The return was made by the suspension bridge.

MONDAY, JULY 11th.—This day's work offered a complete change of scene and of character. An early special train took the party from Kenmare to Rathmore—a detachment being dropped on the way at Loo Bridge to work the promising woods and marshes there—and at Rathmore cars were in readiness to convey the party five miles northward to the scene of the great bog-burst of December, 1896. The country here consists of broad ridges of Coal Measures, tilled for the most part, but the



I. F. C. U. HALTING-PLACE ON THE SHEEN RIVER.

[*J. St. J. Phillips, Photo.*



MUCKSNA AND HEAD OF KENMARE RIVER,
From windows of Southern Hotel, Kenmare.

To face p. 205.]

[*R. Welch, Photo.*

higher portions being often occupied by extensive bogs; and from these eminences splendid panoramic views of the many mountains which stretched along the southern sky-line, were obtained, the Reeks standing clear above all others. Dismounting at the cross-roads beyond Gneevgullia, the party were called together near the site of the luckless Con Donnelly's house while Mr. Praeger gave a brief lecture on the catastrophe, its cause, and its effects. Then a visit to the great depression caused by the outflow of the lower layers of the bog, to the limestone quarry which was filled up, and to the valley down which the flood poured, allowed members to see these effects for themselves. Returning to Quarry Lodge at 2.0 the party found lunch prepared under the welcome shade of a belt of trees—for the day was finer and hotter than ever—and subsequently the cars were again mounted and a move made to Annagh Bridge, three miles down stream, where the full effect of the flood in covering up land was seen. The sense of desolation caused by the scene was dispelled by songs and dances performed by the assembled peasantry for the benefit of the visitors, and after this interlude the party drove to Headfort Junction, where a train was in waiting to convey them again to Kenmare.

TUESDAY, JULY 13th.—As usual, the whistle sounded for breakfast at 8.0 sharp, and at 9.0 the party, reinforced by a number of local friends, were off on cars for the mountain ridge that separates Cork from Kerry. Clouds that had gathered on the higher peaks gave glorious effects as they rose and dispersed under the influence of the brightening sun. The route lay across the suspension bridge and up the Sheen River. At Drumanassig Bridge a halt of two hours was called, and the party were soon widely scattered among the rocks of the fine waterfall close by, or by the deep quiet reaches of the river above the bridge, or along the heathery hill-sides. The botanists were well pleased to discover a good colony of the American "Blue-eyed grass," *Sisyrinchium angustifolium*, and some good photographs and sketches were obtained by others. At noon the journey was resumed. The road runs up the narrowing valley for several miles, and, where the valley branches, it climbs round a rocky wooded spur, and, ascending steeply, runs up a high, narrow ridge, and sweeping round the head of the glen in a semicircle, plunges into the tunnel which runs under the crowning ridge, which forms the boundary between Kerry and Cork. On this long climb a number of characteristic plants and animals were taken. Just on the Cork side of the tunnel Miss Gardiner had a tempting lunch spread ready on the grass, to which the party devoted themselves with serious industry. Then a couple of hours were devoted to exploring the high grounds adjoining, for the tunnel is at an elevation of 1,022 feet. From the summit of Turner's Rock (1,393 feet) a very fine view of Glengarriff and the upper portion of Bantry Bay was obtained, which was improved rather than obscured by drifting sea-fog, that now and then swept over the higher hills—the only thing approaching a shower that the party experienced during the entire week. At 5.30 the last car started for home, and at 8.0 the whole party were again assembled at Kenmare.

Immediately after dinner the tables were cleared, and were as rapidly covered with rock-specimens, insect-boxes, tubes, plant-presses, killing-bottles, setting-boards, and the various weapons of the naturalist, and a general exhibition was given of the specimens which had been collected during the week, and of the modes employed for preserving and displaying them. Dr. G. W. Chaster briefly called attention to the land and fresh-water mollusca, and exhibited some of the characteristic forms; Mr. J. N. Halbert did the same with the insects, and Mr. Praeger with the flowering plants; and for a couple of hours the members, and a large number of local friends who had come in, were engaged in examining the spoils of the excursion.

WEDNESDAY, JULY 13th.—On their last morning members were not idle. An early visit was paid to the convent of St. Clare, which was inspected with much interest, the well-known lace industry attracting particular attention. Then a small but perfect stone circle with a cromleac in its centre, close to the town, was inspected, and two large erratics of Old Red Sandstone lying on the surface of the limestone close by.

The programme provided for the return of the members by the 1.50 train to Dublin, but nearly one-half of the party elected to spend a longer time in Kerry, and the green Field Club Union tickets were in evidence at Parknasilla, Waterville, Caragh Lake, and Killarney during the following week. Some good work was done at Killarney by the snail-hunters and others, and these finds are incorporated in the reports which follow.

National Library, Dublin.

II.—ZOOLOGY.

ARACHNIDA.

BY GEORGE H. CARPENTER, B.SC.

Though circumstances unfortunately prevented my presence at the Kenmare Conference, my friends Messrs. Freeman and Halbert were good enough to collect as many spiders as came in their way, receiving valuable help from some other members of the party. After working over the material, I must confess to some disappointment at finding no species new to the Irish list, but the work done extends our knowledge of the range of several species which had not hitherto been reported from the south-west. In the succeeding notes "Upper Lake" means the Upper Lake of Killarney. Where no locality is given the immediate neighbourhood of Kenmare is to be understood.

DYSDERIDÆ.—*Segestria senoculata*, Kenmare, Upper Lake. *Harpactes Hombergii*.



WOLF-SPIDER (*Pisaura mirabilis*) SPINNING NEST FOR YOUNG.

[R. Welch, Photo.]

To face p. 207.]

DRASSIDÆ.—*Drassus cupreus*. *Prosthesima Latreillei*.

CLUBIONIDÆ.—*Clubiona phragmitis*, Cloonee. *C. terrestris*. *C. reclusa*, Upper Lake. *C. brevipes*. *Anyphcha accentuata*. *Zora spinimana*.

SPARASSIDÆ.—*Micrommata virescens*, Dr. Chaster secured an adult female of this handsome species at Cromaglan. It was taken near Kenmare in 1895, by Mr. W. F. de V. Kane, who had obtained the first Irish specimen in Co. Galway many years ago.

THOMISIDÆ.—*Philodromus aurcolus*, Cloonee. *Tibellus oblongus*, Kenmare and Upper Lake, not previously known in Munster. *Xysticus cristatus*. *X. erraticus*, Upper Lake, also a new record for the province.

AGELENIDÆ.—*Cryphoca sylvicola*, Upper Lake; this spider had not previously been taken in the south of Ireland; its occurrence in the Kenmare district is of much interest, as it is confined to the north in Great Britain. *Textrix denticulata*, Cloonee. *Hahnina elegans*.

DICTYNIDÆ.—*Dictyna uncinata*. *D. latens*, Kenmare and Cloonee. *Amäurobius ferox*.

THERIDIIDÆ.—*Theridion lineatum*, Kenmare, Cloonee, Upper Lake. *T. varians*, Cloonee. *T. sisypthium*, Cloonee. *Enoplognatha thoracica*, Cloonee. *Tiso vagans*, Upper Lake, Cloonee. *Erigone longipalpis*. *E. denticulata*. *Bathypantes dorsalis*, Cloonee. *Lepthyphantes tenuis*. *Labulla thoracica*. *Linyphia hortensis*. *L. pusilla*, Upper Lake, Cloonee. *L. triangularis*, Kenmare, Upper Lake.

ARGIOPIDÆ.—*Tetragnatha extensa*, Kenmare, Cloonee. *T. Solandrii*. *Meta segmentata* and *M. Meriana*, Kenmare, Upper Lake. *M. Menardii*. Cloonee. *Zilla atrica*, Cloonee; this species, so common in northern and eastern Ireland, has been hitherto unrecorded from the south. *Araneus cucurbitinus*. *A. cornutus* and *A. diadematus*, Kenmare, Upper Lake, and Cloonee. *A. quadratus*, Cloonee.

LYCOSIDÆ.—*Pisaura mirabilis*, Kenmare and Upper Lake; Mr. Welch obtained a beautiful photograph (see Plate 7) of the adult female just completing the dome-shaped nest around her egg-cocoon, for the protection of the young after hatching. *Dolomedes fimbriatus*, Upper Lake; this great spider is less common in the south-west than in Connaught; its headquarters in Kerry seems to be Cromaglaun, where the late A. G. More discovered it some ten years ago. *Lycosa leopardus*, Loo Bridge. *L. cinerea*, half grown female from the bank of Roughty River; this fine spider was first found in Ireland by Mr. Halbert, who took it at King's River, Blessington, Co. Wicklow, last year; its occurrence in the far south-west is of interest, as it seems absent from the south of England, though common in many northern localities. *L. ruricola* and *L. terricola*, everywhere. *Pirata piraticus*, Cloonee. *Pardosa palustris*, *P. nigriceps*, and *P. amentata*, Kenmare and Cloonee. *P. pullata* also at Upper Lake.

ATTIDÆ.—*Ergane falcata*, Upper Lake.

The only Harvestmen (Phalangida) obtained were the two common species, *Phalangium opilio* and *Liobunum rotundum*.

Science and Art Museum, Dublin.

INSECTA.

HYMENOPTERA.

BY H. K. GORE CUTHBERT.

The aculeate Hymenoptera noted or collected during the Conference week were not numerous, and hardly any points of unusual interest in regard to them were observed.

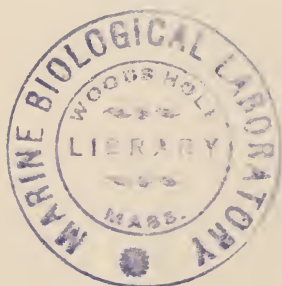
In some respects the places visited by the excursions of the Conference seemed highly suited to yield members of this Order in abundance; possibly, however, from the long-continued cold and wet weather during the spring the aculeates as a whole were poorly represented. The absence of sand-hills, the favoured home of so many of these insects, may also have accounted in part for their comparative scarcity.

Taking them in order, beginning with the more highly organised, the Social Bees were represented by nine species, nearly all from heather on the uplands. Three examples of the variable *Bombus latreillellus*, var. *distinguendus* were taken on Derrinknow, Upper Lough Cloonee. These are all very pale forms. A very light form of *B. cognatus* and a dark form of *B. hortorum* occurred together on rocky ground adjoining the same lough. *B. derhamellus* appeared to be everywhere more abundant than its near ally, *B. lapidarius*, and the form *virginialis* of *B. terrestris* occurred at least six times as often as the form *lucorum*. Among the inquiline Humble-bees, *Psithyrus barbutellus* and *P. campestris* were both taken on the Caha mountains,—the latter also on Mucksna.

Among the diplopterous genera only two of the social wasps, *Vespa vulgaris* and *V. norvegica*, were noticed, both in the woods skirting the Long Range at Killarney; and two of the solitary species, *Odynerus trimarginatus*, on the heather at Cloonee, and *O. parietinus* in the Beech wood near the hotel grounds. Out of four examples of *O. trimarginatus* taken, two, male and female, show the dusky spotting of the tibiæ, a well-marked variation from the type, first noticed by Mr. E. Saunders in specimens from Rosscarbery.

Several *Andrena* were captured, notably *Andrena labialis*, Kirby, new to the Irish list, and *A. coitana*, in the marshes along the Sheen River; also *A. rosea*, *A. wilkella*, and a couple of unusually late examples of *A. nigro-ænea*. A dead specimen of *A. cineraria* was taken from a spider's web near the tunnel on the Glengarriff Road. Among the smaller bees *Sphecodes similis* and *S. pilifrons* were taken at Cloonee, *S. affinis* on Mucksna, and *S. gibbus* in a field beside the hotel. Six *Halicti*, none of them uncommon, were met with; and one *Prosoptis*, *P. confusa*, the only one hitherto recorded as Irish, was taken on a hawkweed at the margin of Lower Lough Cloonee.

The sand-wasps *Pompilus niger*, *P. gibbus*, *Priocnemis exaltatus* and *Ceropales maculata*, were fairly abundant along the Kenmare River, and probably not scarce, though not noticed, in other parts of the district. The genus *Crabro* was represented by *C. varius*, taken at Cloonee, and *C. dimidiatus*, on Mucksna.





NEST OF WOOD ANT (*Formica rufa*) near Long Range, Killarney.

To face p. 209.]

[R. Welch, Photo.]

The Heterogyna (Ants) yielded no new records. The races *scabrinodis* and *ruginodis* of *Myrmica rubra* were common on all uplands and lake shores, the race *lavinodis* occurred once in a small colony on Cromaglaun mountain. *Lasius fuscus*, *flavus*, and *niger* were common everywhere, and two small nests of *Leptothorax acervorum* were met with, one on Cromaglaun, and one, by Mr. Halbert, at Cloonee. Two nests of *Formica rufa* were discovered by Mr. Ragdale in a thicket near the Long Range, These were photographed *in situ* by Mr. Welch, one of the photographs (Plate 8) being reproduced, Another nest occurred on Cromaglaun, near the little tarn, Lough Crincaum.

Thirty-seven species of Aculeates in all were noted, a rather small proportion of the general Irish list compiled about three years ago by Mr. Freke and myself. This list, with subsequent additions, now contains about 130 species, but the general neglect of the Order by Irish entomologists makes its extension by properly authenticated species very difficult.

Two Hymenopterous insects, also from Kenmare district, but not belonging to the aculeate division, may here be noticed, the well-known giant saw-fly *Sirex gigas* L., taken in a wood near the Hotel, and the cimbicid *Abia sericea* L., from Lower Lough Cloonee.

Blackrock, Co. Dublin.

LEPIDOPTERA.

BY THE HON. R. E. DILLON.

In a group like Lepidoptera, in which the night-flying insects are so much more numerous than those that are to be seen by day, it is natural that only a few can be recorded in a week's work in a new locality. The late frosts and subsequent hot weather interfered considerably in the natural emergence of many insects. Lepidopterists also, after spending a long day out, require much time to kill and set on their return, and added to that, the natural disinclination to set to work again in the evening, it follows that little night work could be done. Mr. W. H. Johnson set the example and sallied out to sugar, but little came, owing to the cold mist that rose each night.

At Cloonee, Messrs. Johnson and Neale took *Euthemonia russula*, Mr. Varian a dark form of *Boarmia repandata*, approaching var. *conversaria*, which was taken later by Mr. Stelfox near the hotel. *Melitica aurinia* (common form), by Mr. Johnson, *Melanippe hastata* by Mr. Neale and myself, and two specimens of *Hyria muricata*, rather larger and more suffused with purple, than those I have met with in Galway. Mr. Birchall has recorded this insect from Kerry. It has only been recorded from these two counties.

Pseudoterpna pruinata, freshly emerged, was beautiful and common. *Erastria fasciana* was found by several of the party in the woods, along the Upper Lake of Killarney. *Lycæna minima*, *Thecla quercus*, *Acronycta euphorbie* var. *montivaga* and a large well-marked specimen of *Venusia cambrica* were taken that day.

The electric light of the hotel attracted many insects, which were captured by Mr. Stelfox (who also took *Eucosmia undulata* along the Roughty river), and others, including one of the employes of the hotel. The white plume *Leioptilus pentadactyla*, so common in England and so rare in Ireland, was taken near the hotel. I append a list of the most interesting captures:—

Vanessa io (larvæ). [See Plate 9.]

Melitæa aurinia.—Cloonee.

Cænonympha typhon.

Thecla quercus.—Killarney.

Ino statices.

Euthemonia russula.—Cloonee.

Spilosoma lubricepeda.—Hotel, Kenmare.

Saturnia carpinii (pupæ)—Cloonee.

Bombyx quercus var. *callunæ* (pupæ).

Nudaria mundana.—Hotel, Kenmare.

Hepialus humuli.—Kenmare.

H. velleda.—Kenmare.

H. lupulinus var. *fuscus*.—Kenmare.

H. hectus.—Killarney.

Lophopteryx camelina.—Kenmare.

Gonophora derasa.—Kenmare.

Thyatira batis.—Kenmare.

Acronycta euphorbiæ var. *montivaga*.—Cloonee.

A. rumicis, var. *salicis*.—Kenmare.

Leucania impura.—Hotel, Kenmare.

Hydrecia nictitans.—Kenmare.

Mamestra persicariæ.—Kenmare.

Grammesia trigrammica var. *bilinea*.—Kenmare.

Agrotis lunigera.—Kenmare.

A. corticea.—Kenmare.

A. strigula.—Cloonee.

Noctua triangulum.—Kenmare.

Dianthæcia cucubali.—Kenmare.

Hecatera serena.—Kenmare.

Hadena contigua.—Kenmare.

Habrostola triplasia.—Kenmare.

Plusia pulchra.—Kenmare.

P. chrysitis.—Kenmare.

P. interrogationis.—Cloonee.

Erastria fasciana.—Cloonee and Killarney.

Ellopiæ prosapiaria.—Kenmare.

Boarmia repandata var. *conversaria*.—Killarney.

Pseudoterpna pruinata.—Cloonee.

Hyria muricata.—Cloonee.

Venusia cambrica.—Killarney.

Acidalia dimidiata.—Kenmare.

A. bisetata.—Killarney.

A. aversata.

A. immutaria.—Cloonee.

Cabera pusaria.

C. exanthemaria.

Strenia clathrata.

Aspilates strigillaria.—Cloonee.

Abraças sylvata.—Kenmare.

Emmelesia albulata.

Melanthia ocellata.

M. albicillata.

Melanippe hastata.—Cloonee.

M. tristata.

Phibolapteryx vittata.—Killarney.

Eucosmia undulata.—Roughty.

Cidaria dotata, L.—Killarney.

Pelurga comitata.

Anatis plagiata.—Cloonee.

Tanagra atrata.

Rhodaria sanguinatis.—Killarney.

Ennychia nigrata.—Cloonee.

Bomolocha fontis.—Killarney.

Hydrocampa nymphaea.

H. stagnata.

Leioptilus pentadactyla.—Kenmare.

Clonbrock, Co. Galway.



YOUNG CATERPILLARS OF PEACOCK BUTTERFLY (*Vanessa io*) ON NETTLE.

To face p. 210.]

[*R. Welch, Photo.*

COLEOPTERA.

BY J. N. HALBERT.

Very satisfactory results were obtained by the coleopterists of our party at Kenmare. Many important species were taken, of which no fewer than twenty-one, have not been previously recorded from any Irish locality. Probably a most useful incentive to hard work was the great interest of many of the known animals and plants, which led us to expect rarities in our favourite groups. Though the curious Weevil (*Rhopalomesites Tardyi*) must still remain as supplying the strongest evidence, amongst insects, of former land connections in the south-west, yet many of our captures are almost equally interesting from a distributional point of view. Amongst rediscoveries the place of honour must be given to *Pyropterus affinis*, Payk. Mr. J. R. Hardy was the first to add this extremely local insect to the British list, on the strength of a single specimen taken near Killarney in the summer of 1866. Since then it has occurred in Sherwood Forest, but nowhere else in Britain. Mr. Hardy and Dr. G. W. Chaster made a special search for this insect on the day we were at the Upper Lake, and they were fortunate enough to secure a few more specimens in the old locality. The species is recorded, chiefly from the mountain districts of Sweden, Germany, France and Russia.

The *Longicornia* were disappointingly scarce in the Kenmare district, though we carefully searched for them about the woods. The rarity of the species in this and other families was, to a great extent, due to the lateness of our visit, many of the early summer species disappear rapidly once they reach maturity. The very rare *Strangalia aurulenta* has occurred at Glengarriff, but we could find no trace of it about Kenmare.

I am greatly indebted to Mr. Hardy for the names of several of his best captures. Unfortunately want of time has prevented the working out of all the material collected by himself and Dr. Chaster, but they hope to complete this at a future date. Mr. H. G. Cuthbert has very kindly handed me all of his captures, and many other friends helped considerably by picking up such specimens as they met with. My own work was carried out for the R.I.A. Fauna and Flora Committee. Out of the appended list, containing more than 350 species, the following do not seem to have been previously recorded from Ireland, i.e.:—*Paracynus nigroaeneus*, Sahl. *Bryaxis Helferi*, Schmidt. *Liodes humeralis*, Kug. *Anisosticta xix.-punctata*, L. *Thymalus limbatus*, F. *Corymbites aeneus*, L. *Rhagonycha unicolor*, Curt. *Malthodes flavoguttatus*, Kies. *Hedobia imperialis*, L. *Lyctus canaliculatus*, F. *Donacia semicuprea*, Panz. *Melasoma aeneum*, L. *Phytodecta olivacea*, Forst. *Plagioderma versicolora*, Laich. *Opatrum sabulosum*, Gyll. *Orchesia micans*, Panz. *Clinocara undulata*, Kr. *Lissodema iv.-pustulata*, Marsh. *Anaspis Geoffroyi*, Müll. *Canopsis fissirostris*, Walt. *Cionus pulchellus*, Herbst. The nomenclature used is that of our latest British catalogue (Sharp and Fowler, 1893), and I have to thank Mr.

G. C. Champion, F.L.S., for assistance in the identification of a few critical species. Where no special locality is mentioned, the species occurred in the neighbourhood of Kenmare.

CICINDELIDÆ.—*Cicindela campestris*.

CARABIDÆ.—*Cychrus rostratus*. *Carabus catenulatus*. *C. nemoralis*. *C. clathratus*, a few taken on swampy ground below Turner's Rock, near the Glengariff-road; this fine ground beetle was considered a prize; though locally common in Ireland and Scotland; it has not been heard of from England since Stephens' Norfolk record (1809). *C. granulatus*. *Notiophilus biguttatus*. *Nebria brevicollis*. *N. Gyllenhalii*. *Blethisa multipunctata*, fairly common in marshy spots along the Sheen River. *Elaphrus riparius*. *E. cupreus*. *Loricera pilicornis*. *Clivina fossor*. *Dyschirius globosus*. *Badister bipustulatus*. *Chlanius nigricornis*. *C. holosericeus*, a few specimens of this extremely rare species were captured by Mr. Hardy, Dr. Chaster, and myself on marshy ground by the Sheen River, close to Drumanassig Bridge; this is a very interesting rediscovery, as it has not been found in Ireland since Mr. Stephens' capture of seven specimens on the shore of Lough Derg in 1870; Mr. Haliday possessed a specimen, now in the Dublin Museum, taken near Athy. *Bradycellus distinctus*. *B. harpalinus*. *B. verbasci*. *Harpalus ruficornis*. *H. aeneus*. *H. latus*. *Dichirotrichus pubescens*. *Stomis fumicatus*. *Pterostichus cupreus*. *P. madidus*. *P. niger*. *P. vulgaris*. *P. nigrita*. *P. strenuus*. *P. diligens*. *P. vernalis*. *P. striola*. *Amara apricaria*. *A. communis*. *A. trivialis*. *Calathus cisteloides*. *C. melanocephalus*, and var. *nubigena*. *Taphria nivalis*. *Anchomenus albipes*. *A. marginatus*. *A. parumpunctatus*. *A. viduus*, with var. *mæstus*. *A. gracilis*. *Olisthopus rotundatus*, summit of Mucksna. *Cilleus lateralis*, under stones on shore of Kenmare Bay. *Bembidium lampros*. *B. atrocaruleum*. *B. concinnum*, common along the banks of the estuary below Roughty Bridge; has been recorded from Limerick and Dublin only, but Mr. C. W. Buckle has recently sent it to me from the Foyle district. *B. littorale*. *B. pallidipenne*. *B. bipunctatum*. *Trechus obtusus*. *Pogonus chalceus*. *Dromius linearis*. *D. quadrinotatus*. *D. nigri-ventris*.

HALIPLIDÆ.—*Haliphus ruficollis*. *H. lineatocollis*.

DYTISCIDÆ.—*Noterus sparsus*. *Laccophilus obscurus*. *Calambus inæqualis*. *C. v. lineatus*. *Hydroporus pictus*. *H. lepidus*. *H. erythrocephalus*. *H. obscurus*. *H. nigrita*. *H. pubescens*. *H. palustris*. *Agabus bipustulatus*. *Ilybius fuliginosus*.

GYRINIDÆ.—*Gyrinus distinctus*, *G. natator*, both abundant; the rare *G. bicolor* has been recorded from the Killarney district.

HYDROPHILIDÆ.—*Hydrobius fuscipes*. *Paracymus nigroaeneus*, Sahl. Cloonee Lakes. I took a single specimen in flood refuse from the Erriff River, Co. Galway, in the spring of last year, but it has not been recorded. *Anacæna globulus*. *Philhydrus melanocephalus*. *Chatarthria seminumulum*. *Helophorus æneipennis*. *H. brevipalpis*. *Cyclonotum orbiculare*, lake shores. *Sphæridium scarabæoides*. *Cercyon littoralis*. *C. hæmorrhoidalis*. *C. flavipes*. *C. melanocephalus*. *C. pygmaeus*. *Megasternum boletophagum*. *Cryptopleurum atomarium*.

STAPHYLINIDÆ.—*Aleochara fuscipes*. *A. lanuginosa*. *Astilbus canaliculatus*. *Homalota vestita*. *H. halobrectha*. *H. atramentaria*. *H. fungi*. *Grypeta labilis*, Sheen river, running on mud. *Xenusia sulcata*, a few under seaweed at the head of Kenmare Bay, has occurred on Achill. *Tachyporus nitidicollis*. *T. solutus*. *T. hypnorum*. *T. pusillus*. *Tachinus rufipes*. *Quedius mesomelinus*. *Q. cinctus*. *Q. fuliginosus*. *Q. molochinus*. *Q. rufipes*. *Q. semiæneus*. *Q. boops*. *Staphylinus erythropterus*. *S. casareus*. *Ocytus olens*. *O. cupreus*. *O. ater*, abundant on shore. *O. morio*. *Philonthus æneus*. *P. laminatus*. *P. politus*. *P. varius*. *P. marginatus*. *P. umbratilis*. *P. trossulus*. *Cafus fucicola*. *C. xantholoma*. *Xantholinus glabratus*. *X. punctulatus*. *X. linearis*. *Othius fulvipennis*. *Lathrobium fulvipenne*. *L. brunnipes*. *L. quadratum*, marshy ground by Sheen river. *Paderus fuscipes*, Curtis; several specimens of this pretty "staph" were secured by sweeping rushes in damp places along the shores of the bay; I have also taken it near Dingle. *Stenus junco*. *S. speculator*. *S. buphthalmus*. *S. brunnipes*. *S. pubescens*. *S. pallitarsis*. *S. nitidiusculus*. *S. picipes*. *S. similis*. *S. tarsalis*. *Haploderus cælatus*. *Micralymma brevipenne*, common under stones in company with *Cillen*, on the shore near Kenmare. *Philorhinum sordidum*, off Gorse.

PSELAPHIDÆ.—*Bryaxis Helfer*, under stones head of Kenmare Bay, not previously recorded; Mr. C. W. Buckle has taken it in the Foyle district. *B. juncorum*, amongst shingle.

SILPHIDÆ.—*Liodes humeralis*, taken by Mr. Hardy in fungi. There is a specimen in the Dublin Museum, taken by Mr. Halliday in Co. Wicklow, but I know of no others. *Anisotoma calcarata*. *Necrodes littoralis*. *Silpha opaca*. *S. rugosa*. *S. subrotundata*. *Choleva grandicollis*. *C. Wasoni*.

HISTERIDÆ.—*Hister neglectus*, under a decaying salmon by the Roughty river. *H. carbonarius*, common. *H. xii-striatus*, one specimen taken by Mr. Cuthbert, first record for the south-west. *Saprinus nitidulus*. *S. æneus*. *S. maritimus*, common.

COCCINELLIDÆ.—*Anisosticta xix-punctata*. Mr. Cuthbert found a specimen of this pretty species in Kenmare wood. *Coccinella x-punctata*. *C. hieroglyphica*, on heather. *C. xi-punctata*. *C. vii-punctata*. *Halysia xvi-guttata*. *H. conglobata*, common in willows. *Rhizobius litura*. *Coccidula rufa*.

MICROPEPLIDÆ.—*Micropeplus porcatus*, a few specimens among dead leaves, and by sweeping in the wood.

NITIDULIDÆ.—*Brachypterus urticae*. *Cercus rufilabris*. *Epuræa æstiva*. *Meligethes æneus*. *M. viridescens*. *M. picipes*. *M. obscurus*, Fr., a few by sweeping; a local, though widely distributed species in Ireland.

TROGOSITIDÆ.—*Thymalus limbatus*, twenty specimens taken by Mr. Hardy from a mass of leaves and fungi.

COLYDIDÆ.—*Cerylon histeroide*, Killarney, Mr. Hardy.

LATHRIDIDÆ.—*Enicmus minutus*. *E. transversus*. *Melanophthalma gibbosa*.

CRYPTOPHAGIDÆ.—*Telmatoophilus caricis*. *Cryptophagus dentatus*. *Micrambe vini*. *Paramecosoma melanocephalum*, rare. *Atomaria atricapilla*. *Ephistemus gyrimoides*.

BYTURIDÆ.—*Byturus tomentosus*, abundant on flowers.

PARNIDÆ.—*Elmis Volkmar*. *Parnus prolifericornis*.

SCARABÆIDÆ.—*Aphodius fossor*. *A. fimetarius*. *A. ater*. *A. lapponum*, taken on Mucksna; new to the south-west. *A. prodromus*. *A. rufipes*. *A. depressus*, black variety. *Geotrupes stercorarius*. *G. sylvaticus*. *Serica brunnea*. *Phylopertha horticola*. *Cetonia aurata*, a single example only on flowers.

ELATERIDÆ.—*Lacon murinus*. *Cryptohypnus riparius*. *Civ.-guttatus*. *Athous hamorrhoidalis*. *Adrastus limbatus*. *Agriotes lineatus*. *A. obscurus*. *Corymbites cupreus*. *C. æneus*, an imperfect specimen taken by Mr. Standen below the Tunnel, Glengariff-road.

DASCILLIDÆ.—*Dascillus cervinus*, frequent. *Helodes minuta*. *Cyphon variabilis*. *C. padi*. *Hydrocyphon deflexicollis*, abundant in damp places.

MALACODERMIDÆ.—*Pyropterus affinis*, rediscovered by Mr. Hardy and Dr. Chaster in the only known Irish locality near Killarney, a small series of specimens, taken in decaying Birch, and by sweeping. *Telephorus nigricans*, taken by Mr. Standen in the valley below Turner's Rock. *T. bicolor*. *T. paludosus*. *T. flavilabris*. *T. thoracicus*, locally common on willows. *Rhagonycha unicolor*, Killarney, beaten out of Oak trees by Mr. Hardy. *R. fulva*. *Malthodes marginatus*. *M. flavoguttatus*, Kies.; I took one specimen of a *Malthodes* near the Cloonee Lakes, that seems to be referable to this species. *Malachius bipustulatus*, two specimens taken by Mr. Hardy near the Cloonee Lakes. *Dasytes ærosus*, off Oaks at Cloonee, Mr. Hardy.

CLERIDÆ.—*Psilothrix nobilis*. *Necrobia ruficollis*, taken by Mr. Cuthbert in the hotel.

PTINIDÆ.—*Hedobia imperialis*. Mr. Hardy got this local species out of an old thorn fence at Carrigacappeen.

LYCTIDÆ.—*Lyctus canaliculatus*, three specimens swept from amongst herbage near Kenmare by Mr. Hardy.

CRAMBYCIDÆ.—*Clytus arietis*, two specimens taken near Kenmare. and another on the Glengariff-road, by Mr. Hardy. *Strangalia armata*, Kenmare; Mr. F. Neale got a specimen near the Upper Lake.

BRUCHIDÆ.—*Bruchus villosus*, one specimen swept off Broom near Drumanassig Bridge by myself, the second known locality in Ireland.

CHRYSOMELIDÆ.—*Donacia dentata*, taken by Mr. Cuthbert on *Nymphæa alba* in Lough Crincaum on Cromaglaun Mountain. *D. semicuprea*, two specimens found in the same locality as the preceding; seems to be rare in Ireland, these are the first that I have seen. *D. discolor*, abundant on heaths, often at a distance from water. *D. braccata*, first taken in Ireland by Mr. Birchall at Lough Crincaum, nearly forty years ago; Mr. Hardy tells me that Mr. Standen and himself got a specimen each, in the Sheen River, and he also met with it on Dinish Island, Killarney; the species is local in south-eastern England. *Lema lichenis*. *Lamprosoma concolor*. *Chrysomela Banksi*. *C. staphylea*. *C. varians*, Mr. Hardy took a specimen at Killarney, and I got one by sweeping on Mucksna; this is evidently a western species with us, as it extends into Galway and Donegal, but it has not been found, so far, in our eastern counties. *Melasona æneum*, three specimens on willow in St. Finan's Graveyard, by Mr. Hardy. *Phytodecta olivacea*, several on Gorse and



To face p. 215.]

From I. F. C. U. Rendezvous.

THE UPPER LAKE AND LONG RANGE.

Eagle's Nest on left. Torc Mountain on right.

[K. Welch, Photo.

Muckross lake in the distance.

Broom about the Cloonee Lakes by Mr. Hardy and myself. *Gastroidea viridula*. *Plagiodera verticollata*, two examples taken by Mr. Cuthbert in the Kenmare Wood. *Hydrothassa marginella*. *Prasocuris junci*. *P. phellandrii*. *Phyllobrotica quadrimaculata*, Cloonee, a pair taken by Mr. Hardy; very local in Ireland, Mr. Birchall took it many years ago at Muckcross. *Lochmea caprea*, frequent on willows. *L. suturalis*. *Galerucella lineola*. *G. californiensis*. *G. tenella*. *Longitarsus luridus*. *L. melanocephalus*. *L. jacobææ*. *Phyllotreta undulata*. *Aphthona lutescens*. *A. nonstriata*. *Crepidodera transversa*. *C. ferruginea*. *C. helxines*. *Psylliodes affinis*. *P. napi*. *Cassida viridis*.

TENEBRIONIDÆ.—*Opatrum sabulosum*, several under an old sack on the shore of Kenmare Bay, near Mucksna, by Mr. Hardy; locally common along the southern English coast, but not previously known from Ireland. *Helops striatus*.

LAGRIIDÆ.—*Lagria hirta*, abundant.

MELANDRYIDÆ.—*Orchesia micans*, bred in numbers from a fungus growing on Birch, by Mr. Hardy. *Clinocara undulata*, a single example "shaken out of a mass of fungus-grown leaves," by Mr. Hardy.

PYTHIDÆ.—*Lissodema quadripustulata*, beaten from Oaks near the Upper Lake. *Rhinosimus viridipennis*.

CEDEMERIDÆ.—*Cedemera lurida*, one specimen found by Mr. Rogers, on a wall at Kenmare; and a few more near the same place by Mr. Hardy recorded by Mr. Birchall, from Muckcross (Zool. 1859).

MORDELLIDÆ.—*Anaspis frontalis*, common. *A. Geoffroyi*, taken by Mr. Hardy in the Privet fence near the hotel. *A. ruficollis*. *A. maculata*.

CURCULIONIDÆ.—*Apion hamatodes*. *A. viciae*. *A. apricans*. *A. dichroum*. *A. carduorum*. *A. virens*. *A. striatum*. *A. ervi*. *A. Gyllenhalii*. *A. scutellare*. *A. loti*. *A. violaceum*. *A. hydrolapathi*. *A. humile*. *Otiorrhynchus atrocapterus*. *O. ligneus*. *O. picipes*. *O. sulcatus*. *O. rugifrons*. *Cænopsis fissirostris*; I found one specimen of this local species by sweeping in the Kenmare demesne, in company with the remaining British species *C. Waltoni*. The genus *Cænopsis* has an interesting south-western range in Europe. *Strophosomus coryli*. *S. retusus*. *Sciaphilus muricatus*. *Liophlæus nubilus*. *Polydrusus tereticollis*. *P. pteromalus*. *Phyllobius oblongus*. *P. argentatus*. *P. viridiaeris*. *Barynotus obscurus*, under stones on shore. *B. Schonherri*. *Alophus triguttatus*. *Sitones regensteiniensis*. *S. tibialis*. *S. flavescens*. *S. lineatus*. *Hypera punctata*. *H. rumicis*. *H. polygona*. *H. variabilis*. *H. plantaginis*. *H. nigrirostris*. *Liosoma ovatum*. *L. oblongulum*, very local, though probably overlooked in Ireland; has occurred at Galway and Armagh. *Orchestes fagi*. *Rhamphus flavicornis*, abundant. *Grypidius equiseti*. *Erirrhinus acridulus*. *Dorytomus tortrix*. *D. maculatus*. *D. pectoralis*. *Gymnetron pasuorum*, taken by Mr. Hardy. *Mecinus pyrauster*. *Anthonomus pedicularius*. *A. comari*. *Nanophyes lythri*. *Cionus pulchellus*, taken at Kenmare by Mr. Hardy; there is an Irish-taken specimen in the Haliday collection, but the species is not recorded. *Oribitis cyaneus*. *Caliodes iv.-maculatus*. *Ceuthorrhynchus ericæ*. *C. contractus*. *C. pollinarius*. *Ceuthorrhynchidius troglodytes*. *Rhinoncus pericarpus*. *Limnobaris T-album*.

Balaninus salicivorus. *Rhopalomesites tardyi*, this very interesting weevil occurs about Kenmare in the decaying stumps of various trees, and Mr. Hardy got a few near Killarney, where it has long been known to abound; the majority of the allied species have a very restricted range in south-western Europe and in the Atlantic Islands; *R. tardyi* is locally abundant all over Ireland, Mr. C. W. Buckle has taken it recently in great number in the north of Donegal.

Science and Art Museum, Dublin.

HEMIPTERA.

(Collected for the R.I.A. Fauna and Flora Committee).

BY J. N. HALBERT.

Our knowledge of the Irish "plant-bugs" is as yet very scanty, collectors as a rule preferring to devote their time to the more popular moths and beetles. Consequently our work at Kenmare was particularly useful in extending the known range of many of these interesting insects into the south-west. The Hemiptera are most numerous in the late summer and autumn, so that when we were at Kenmare numbers of species were in the preparatory stages, and it will be noticed that a few of the best species have had to be inserted in the following list on the strength of the occurrence of immature specimens, but this has only been done in cases where there could be no doubt as to their identity.

At least three out of the seventy species in the following list are now recorded as Irish for the first time, *i.e.*, *Coreus denticulatus*, Scop., *Salda Muelleri*, Gmel., and *Orthotylus chloropterus*, Kb. The *Salda* is a very interesting addition. Mr. Cuthbert captured two specimens on Cromaglan Mountain. I met with a specimen on a boggy heath near the Dublin Mountains in the summer of 1893, when this was considered, in common with the known British examples, to be *Salda morio*, Lett., until Mr. E. Saunders pointed out the differences (*E.M.M.*, Oct. 1895). *Salda Muelleri* is attached apparently, though not exclusively, to high districts in Britain, and in Europe the distribution, according to Dr. Puton, is Scandinavia, Finland, and France. The arrangement followed, is that of Mr. Saunders' "Catalogue of British Hemiptera."

PENTATOMIDÆ.—*Eurygaster maura*, several immature examples swept from amongst long grass near Kenmare; Mr. Cuthbert has taken it on the Cork coast, but I know of no other locality for this local species in Ireland. *Pentatoma baccarum*, abundant. *P. prasina*, evidently common, but mostly immature at the time of our visit. *Tropicoris rufipes*. *Picromerus bidens*. *Podisus luridus*, immature, swept off Birch; I had previously taken this species in Clare and at Clonbrock; Mr. Dillon finds the imago at the latter place, in late autumn. *Acanthosoma hamorrhoidale*, swept off Birch.

COREIDÆ.—*Syromastes marginatus*, this fine plant bug is characteristic of the south-west; it has not as yet been found in any other part of Ireland; occurs on heaths. *Coreus denticulatus*, a single immature example swept up from an open heathy spot, in a wood, at the foot of Mucksna.

LYGÆIDÆ.—*Cymus grandicolor*, abundant in damp places. *Stygnus pedestris*. *S. arenarius*. *Drymus sylvaticus*. *D. brunneus*, a few specimens in the woods, *Scolopostethus neglectus*. *S. decoratus*.

TINGIDIDÆ.—*Monanthia cardui*.

HYDROMETRIDÆ.—*Hydrometra stagnorum*. *Velia currens*. *Gerris najas*, this fine species was abundant on the Cloonee Lakes where Mr. Welch took a series in May, it also occurred on pools in the Sheen River. *G. thoracica*, not common. *G. lacustris*.

REDIVIDÆ.—*Nabis lativentris*. *N. flavomarginatus*. *N. limbatus*. *N. rugosus*.

SALDIDÆ.—*Salda saltatoria*. *S. scotica*, abundant on rocks in the bed of the Sheen river. *S. Muelleri*, two specimens taken by Mr. Cuthbert on Cromaglaun Mountain.

CIMICIDÆ.—*Temnostethus pusillus*. *Anthocoris nemoralis*. *A. sylvestris*. *Microphysa elegantula*, abundant on some old lichen-covered Blackthorns near Kenmare; it has occurred in a similar habitat at Clonbrock, Co. Galway.

CAPSIDÆ.—*Pithanus Macrkeili*, common. *Miris calcaratus*. *M. laevigatus*. *Megalocera ruficornis*. *Tetracoris Saundersi*, obtained commonly by sweeping rushes in a salt-marsh on the south side of Kenmare Bay; the species is widely distributed though local, I have met with it in Galway, Louth, and Dublin. *Leptopterna ferrugata*. *Monalocoris siliis*. *Phytocoris varipes*. *Calocoris striatellus*, immature off Oaks. *C. sexguttatus*. *C. bipunctatus*. *C. roseomaculatus*. *Oncognathus binotatus*, frequent in meadows. *Plesiocoris rugicollis*, off willows. *Lygus pratensis*. *L. contaminatus*. *L. pabulinus*. *L. pastinacæ*. *L. cervinus*. *Liocoris tripustulatus*. *Rhopalotomus ater*. *Labops saltator*. *Campyloneura virgula*. *Cyllocoris histronicus*. *Mecomma ambulans*. *Orthotylus marginatus*. *O. chloropterus*, one specimen off Broom, new to the Irish list. *Heterotoma merioptera*, immature; the structure, however, of the second antennal joint is characteristic. *Phylus melanocephalus*. *Psallus ambiguus*. *P. lepidus*. *P. varians*. *Plagiognathus viridulus*. *P. arbustorum*.

NEPIDÆ.—*Nepa cinerea*, frequent in the lakes.

CORIXIDÆ.—*Corixa striata*. *C. Linnei*.

About twenty species of Homoptera were collected, but most of these yet await examination. *Oliarus leporinus*, Linn., however, is worth recording here. This local species occurred commonly amongst a growth of coarse grass and Sweet-Gale about the Upper Lake. It is local in the south and west of England, and I have no record of its previous capture in Ireland.

Science and Art Museum, Dublin.

MOLLUSCA.

BY R. STANDEN,

Hon. Curator, Conchological Society of Great Britain and Ireland.

Conchological research at the Kenmare meeting was, on the whole, carried out under the very worst conditions possible, due chiefly to the tropical heat, and consequent dryness of everything. However much the fine weather might conduce to the general enjoyment, the long continued drought—which dated from the 6th of June previous, and continued throughout our stay—was highly inimical to shell-collecting. It was purely by dogged perseverance on the part of the eight or nine workers, combined with much experience, that anything like a respectable record for the district was ultimately obtained, and the richness of the molluscan fauna demonstrated.

The numerous woods which stud the mountain-sides and valleys, and fringe the rivers, streams, and lakes, grow principally on stony ground covered with a wild profusion of mosses, ferns, and hosts of other plants beloved by snails. The rock-masse on the hillsides, and the old walls, clothed with an exquisite drapery of moss, ferns, ivy, and other creeping plants, afford shelter to many species of land molluscs. Ancient Irish graveyards are usually a favourite haunt of land shells, and we found that of St. Finan's a veritable treasure-house for many kinds, which swarm upon the old tombstones, decaying coffin-boards, and rank shoulder-high growth of nettles and other plants which overrun the place in wild luxuriance.

From every likely place bags full of moss-shakings, siftings of débris, and rejectamenta of rivers and lakes were carefully collected and transported home for leisurely examination. The results of this easy method of dry-weather collecting have proved very satisfactory, especially from Mucksna Wood, Kenmare, and Torc Wood, Killarney.

The freshwater molluscs are but poorly represented throughout the district. The many lakes and streams examined yielded but few species, and those of a somewhat stunted growth. One would certainly expect to find more shell life in such quiet streams as the Loo, with its deep clear water, and profusion of aquatic plants, but even this charming river is very barren. I can only account for this poverty by supposing the streams and lakes to be tainted with bog water, in which snails do not thrive. The abundance of fish may also have an adverse influence. We found most of the little pools and narrow ditches dried up, so that it was easy to pick whatever shells had been left stranded on the mud.

In the compilation of the following list of 62 species observed in the Kenmare and Killarney district, I have received much valuable assistance from all my co-workers, and more especially from Messrs. Chaster, Collier, and Welch, who have furnished many important notes. I am also deeply indebted to Mr. Charles Oldham for kindly undertaking the identification of doubtful *Pisidia*. In the list I have included not only all records made during Conference week, and the extension trip

by Messrs. Chaster and Collier to Killarney, but also those made by Mr. Welch in May last. For convenience of reference I have used the nomenclature and classification employed by Dr. Scharff in his "List of Irish Mollusca." In all cases where a species was only taken by *one* individual in a particular locality, the collector's name follows in brackets. The Killarney records of Messrs. Chaster and Collier are indicated by their initials (C. & C.) following the locality.

Vitrina pellucida, Müller. — A small thin form, living, at Loo Bridge, and Roughty Bridge. A few dead shells from moss-shakings. Mucksna Wood, and Sheen Waterfall; it occurred also near the Southern Hotel, and in a glen above Galway's Bridge (Welch).

Hyalinia cellaria, Müller. — Fairly abundant everywhere, but not very large, as a rule. Some good-sized specimens from Mucksna Wood and Torc Wood possess all the outward characteristics of *H. Draparnaldi* Beck, but Mr. W. Moss, to whom they have been submitted, informs me that the genitalia and radula show them to be *H. cellaria*, although the shells are not typical of that species. The animals are all light coloured.

H. alliaria, Miller. — Plentiful, along with var. *viridula*, in St. Finan's graveyard, Kenmare demesne, Mucksna Wood, Galway's Bridge (Welch), Torc Woods (C. & C.).

H. nitidula, Drap. — Loo Bridge, along with var. *Helmii*. The type only at Sheen, St. Finan's, Roughty Bridge, and other localities, and mostly small in size. On an island in Middle Cloonee Lake a remarkably thin fragile form of var. *Helmii*, almost as thin as *Vitrina*, occurred, but the type was not observed.

H. pura, Alder. — According to Dr. Scharff's List, this is hitherto unrecorded for Kerry. We found a few specimens in Mucksna Wood, at Loo Bridge, Sheen (Welch), and in woods near the Tunnel, Killarney. All these were the whitish form erroneously named "*var. margaritacea*" by Jeffreys—but which is really Alder's *type*. The brown form—*var. nitidosa*—occurred along with the type in Torc Woods (C. & C.).

H. radiatula, Alder. — Occurs everywhere, in suitable situations, and is quite the commonest of the *Hyalinie* in the district. The *var. viridescens-alba* is more plentiful than the type. The North American *Zonites viridulus* is identical with our *Hy. radiatula*, and it is at least somewhat curious, that in the case of S. W. Ireland, where American types of plants and insects occur, most of the specimens should be the greenish variety, which is comparatively rare in other parts of Ireland, and decidedly so in England. The American form was named *Z. radiatulus var. albus* by Jeffreys (*Ann. Mag. N. H.* 1872, p. 245).

H. crystallina, Müller. — Common at Sheen, Loo Bridge, and Mucksna Wood. A few at Roughty Bridge, Kenmare demesne, Galway's Bridge (Welch), and on island in Middle Cloonee Lake. Occurred amongst rejectamenta of Muckros Lake, and in Torc Woods (C. & C.), Gap of Dunloe (Chaster), and at Strickeen Wood (Farran). Near Glengarriff Tunnels it was found three inches below surface of ground in banks of a stream.

H. contracta, Westerlund. — Occurred in moss-shakings from Mucksna and Torc Woods. This is a very feeble "species," and should, in my opinion, rank merely as a variety of *Hy. crystallina*, and is so recognised in the Conchological Society's "List of British L. and F. W. Mollusca," 1892. It is distinguished from *Hy. crystallina* by the equal breadth of the two last whorls, which gives it a contracted appearance—hence its name.

H. fulva, Müller.—Mucksna Wood, Loo Bridge, Strickeen Wood (Farran), Sheen, Muckros Lake, Lower Lake, and Torc Cascade rejectamenta (C. & C.), Glens Wood (Chaster). A few from each locality.

H. excavata, Bean.—Type and var. *vitrina* only occurred together at Cloonee (Chaster). Elsewhere the variety is the most prevalent form, and is especially abundant at Mucksna Wood, Inchiquin, and in Kenmare Demesne. It does not appear to have any special predilection for the limestone.

Arion ater, L. — Common everywhere, even at a considerable elevation. Type, and vars. *brunnea*, *plumbea*, and *bicolor*. Very large jet black specimens at Moll's Gap. Usually of lighter colour in the woods and valleys on low ground than on roadsides. Near Glengariff individuals were found in the centre of dried up balls of *Sphagnum* which had grown in the tufts of heather, and still retained a little moisture, though so dry on the outside as to crumble in the fingers like dust.

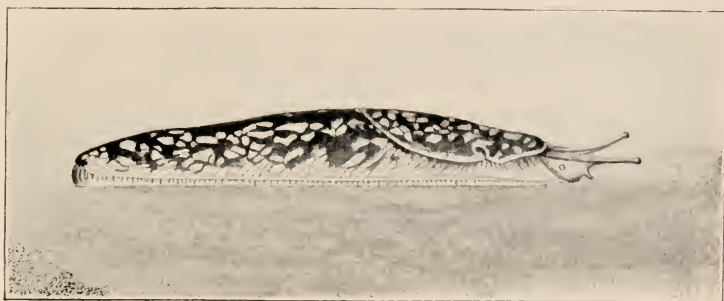
A. subfuscus, Drap.—Found sparingly in every locality visited. Var. *aurantiaca* in Sheen Wood, and on island in Middle Cloonee Lake. This species was not noticed by Mr. Welch during his May visit.

A. hortensis, Fér.—Not uncommon in Mucksna Wood. Plentiful all over the district in May (Welch).

A. circumscriptus, Johnst. — Several in Sheen Wood, one at Kenmare, and one at Galway's Bridge (Welch).

A. intermedius, Normand. (= *A. minimus*, Simroth.)—Not uncommon in Kenmare demesne, and in wood on road to Glengariff. One at Loo Bridge, several in Mucksna and Sheen Woods, and a few at Galway's Bridge, Killarney (Welch).

Geomalacus maculosus, Allman. — During a preliminary run through the district last May, to arrange for the July meeting of the Field Clubs, Mr. Welch found this interesting slug plentiful all along the roadside dykes from Kenmare to about half a mile beyond Cloonee Lakes, and on the wet lichen-covered rocks in other places. Over 40 specimens were taken, some almost black, with vivid yellow spots. Many of us had looked forward to making the personal acquaintance of the "Kerry Slug" in its native habitat, but alas! our expectations were doomed to disappointment, for the tropical heat had driven the animals into their impregnable retreats, far down in the chinks and crannies of the massive rocks and strong stone dykes, and in spite of all our efforts we failed to make a single capture. This failure furnished a subject for much good-humoured chaff, aimed at the unfortunate "snail-hunters" by their non-conchological friends! *Geomalacus* is known to possess the power of



THE SPOTTED SLUG OF KERRY, *Geomalacus maculosus*. (Nat. size).
After a drawing from life by Dr. Scharff.



MOLL'S GAP.

Ice-rounded rocks in foreground; peak of Derrygariff (1617 feet) behind.
To face p. 220.

[*R. Welch, Photo.*

elongating its body to a most remarkable extent—after the manner of *Testacella*—so as to enable it to enter very narrow crevices. Of this power I had a striking illustration in some specimens Mr. Welch sent to me from Kenmare last May. They were enclosed in an ounce “Navy Cut” tobacco box, and during transit three had crawled through the small holes—two millimetres in diameter—in ends of box, leaving a mass of slime inside, which had been scraped off their bodies, and were found inside the wrapper of the parcel apparently none the worse for their experiences.

Limax maximus, L.—Fine typical specimens at Strickeen (Farran), Killowen old church, Kilmakilloge (Bigger), Torc Woods (Chaster). Some very large and beautiful examples of var. *Ferrussaci* occurred in Kenmare Demesne, and on island in Middle Cloonee Lake, also at Loo Bridge.

L. marginatus, Müller.—Common. Its slime tracks may be seen anywhere on the mossy tree trunks. Near Glengarriff Tunnels a damp knot-hole in an old elm tree was found crowded with individuals of all sizes, evidently seeking shelter from the heat.

Agriolimax agrestis, L.—Swarming everywhere; var. *plumbea* on Glengarriff road, and var. *sylvatica* at Sheen, and Galway’s Bridge, were both noted. A dark purple variety was also found at Galway’s Bridge (Welch).

A. lævis, Müller.—A very dark form at Mucksna Wood, several under logs near Loo Bridge, one at Roughty Bridge (Welch), a light-coloured form under debris on river bank above Galway’s Bridge, (Welch), Torc Woods (Chaster).

Amalia Sowerbyi, Fer.—Several small specimens near Southern Hotel Kenmare.

A. gagates, Drap.—Typical examples under the *Arbutus* trees on island in Middle Cloonee Lake (Ragdale).

Helix pygmæa, Drap.—Woods near Inchiquin Lake (Collier), Torc Woods and near the cascade, Killarney (C. & C.), and in rejectamenta of Muckros Lake (Chaster).

H. rotundata, Müller.—Generally distributed, but not particularly abundant anywhere, except in Torc Wood (C. & C.). Four specimens of var. *alba* near St. Finan’s ‘holy well’ (Hardy).

H. rupestris, Drap.—Common at Clady, Sheen, Killowen, and elsewhere throughout the limestone district near Kenmare; off this area it occurs mainly on limestone walls, as at Mucksna (Stelfox).

H. pulchella, Müller.—Type only. Occurs sparingly at Roughty Bridge, Loo Bridge, St. Finan’s, Killowen, and in Kenmare demesne.

H. aculeata, Müller.—Sheen Valley, in wood at Drumanassig Bridge, Loo Bridge (Chaster), Mucksna Wood, in rejectamenta of Muckros Lake, and in Torc Wood (C. & C.).

H. lamellata, Jeff.—This exquisite little species occurred under Holly bushes in a wooded glen at Inchiquin; and also in the same habitat near Loo Bridge, and in the Torc Woods (C. & C.). Common under Beech leaves in the wood just below the Southern Hotel; and a few were taken on cattle droppings on the wooded slopes stretching down from the

coach road to the shores of the Upper Lake, Killarney. Plentiful in Mucksna Wood, on dead oak leaves under fir trees. Mr. Welch here picked up 24 living specimens from a space his hand could cover, whilst I filled a small bag with dead leaves from which I afterwards picked about 200 examples in beautiful condition.

H. hispida, L.—Not common. Type, and a dark red form of var. *concinna* at Mucksna Wood. Type only at Sheen, a few very large specimens at Roughty Bridge, Carrigacappen, and a few in Lord Kenmare's demesne at Killarney (Chaster).

H. rufescens, Penn.—The roadside wall at Mucksna Wood yielded some fine examples of vars. *alba* and *rubens*, together with typical specimens of unusual size, 14 mills. across. The immature shells here were beautifully hispid. Var. *alba* also occurred at Killowen, and near the Tunnel, Killarney. Type at Loo Bridge, but few; common at St. Finan's, along with a few var. *rubens*. Plentiful generally on the limestone about Kenmare, and near Killarney (C. & C.).

H. sericea, Drap.—In the old graveyard at St. Finan's well there is a large colony of this very local species on the nettles and tall *Heracleum*. It owes its discovery to the entomologically inclined conchologists, from whose sweeping nets the first specimens came. It was the first time either I or my companions had taken this species in Ireland.

H. fusca, Mont.—One specimen at Mucksna; dead shells on the island in Middle Cloonee Lake (Ragdale); one very large example at roots of Wood Rush, near Loo Bridge, and another near Sheen Falls (Welch); very common whilst sweeping for beetles in Derrycunihy Wood on Cromaglaun Mountain (Chaster).

H. intersecta, Poir. (= *H. caperata* Mont.).—Very abundant on roadside near the suspension bridge, Kenmare, but its headquarters appear to be an old quarry near the stone circle, Cromwell's Bridge. All observed were typical, without any marked variation. The occurrence of this species is interesting, as it is one of the four xerophilous *Helices* specially quoted by Dr. Scharff, in his "Origin of the European Fauna," as being absent from this particular district.

H. nemoralis, L.—Evidently not uncommon, but having retreated to escape the heat, only occasional specimens were met with. All found were highly coloured, large, and exceptionally thin-shelled, with ordinary banding. Loo Bridge, Killowen cromlech, Sheen, Mucksna wood, Kenmare demesne, and Cloonee; also at Muckros Abbey and Aghadoe Church (C. & C.); and Moll's Gap—700 feet above the sea level (Welch). Var. *rubella*, with white lip, at Mucksna wood.

H. aspersa, Müller.—Common in the lower lying parts of the district. In several places we found cavities in walls crowded with individuals of all sizes, vainly endeavouring to escape the heat. In some cases the animals had contracted themselves so far within the shells as to form two, or even three, separate epiphragms. It is especially abundant at Cloonee; on walls between suspension bridge and Mucksna; and in Killmakilloge graveyard (Bigger). Like the generality of Irish specimens, little variation was shown, except a few approaching var. *zonata*—very handsome shells.

Cochlicopa lubrica, Müller.—Not plentiful. A very pale form of var. *hyalina* was taken at Mucksna, which was practically an albino. At Roughty Bridge, and near Carrigacappeen, we found a very large and beautiful form of var. *ovata* with bright red lip. All found in the Kenmare district were an intermediate form between type and var. *lubricoides*. Some very attenuated forms of var. *lubricoides* occur on island in Middle Cloonee Lake, together with the type. Torc Woods (C. & C.).

Pupa anglica, Fér.—Loo Bridge, and Kenmare demesne, type only. In Mucksna Wood some very beautiful white-lipped specimens occurred, also var. *pallida*. Very abundant in Torc Woods, and especially so under stones near Torc Cascade (C. & C.). Amongst them Mr. Collier found some of a yellowish colour with white lip, the animals being pure white, and when the tentacles were extended the eyes showed as vivid black spots. The bulk of the specimens collected were, however, the ordinary dark form with reddish lip. Mr. Collier also took this species under the top stones of a high wall at Muckros along with *P. cylindracea*—a most unusual situation. In Mucksna Wood he found four pure white examples.

Pupa cylindracea, Da Costa.—Swarms all over the limestone. Strickeen Wood: 26 on one small piece of coal (Farran); St. Finan's graveyard, a very rotund form; Killowen, var. *curta*; on Glengarriff road (1,000 feet); Loo Bridge, an elongated form with dark lip; Mucksna Wood, var. *curta*, and one beautiful specimen of var. *alba*; Sheen, type and var. *curta*; Carrigacappeen, and near Galway's Bridge (Welch). The variation of this shell in places not far apart is remarkable. In Torc Woods it is light coloured and very thin; on the wall surrounding Muckros demesne it is very dark and much longer than usual (C. & C.).

Vertigo edentula, Drap.—The commonest *Vertigo* in the district. It turned up in all the moss-shakings, and great numbers came into the sweeping nets used for beetle-catching.

V. pygmæa, Drap.—A few from moss-shakings at Mucksna Wood. Loo Bridge, and Kenmare demesne. Under old coffin-boards in St. Finan's graveyard; Killowen cromlech; Torc Woods, Killarney (C. & C.).

V. substriata, Jeff.—A few living specimens from moss-shakings at Mucksna Wood, and near Torc Cascade, Killarney (C. & C.).

V. antlvertigo, Drap.—Occurred on a boggy slope, in wood near Loo Bridge, in company with *Limnæa truncatula*; also in rejectamenta of Muckros Lake (C. & C.).

Balea perversa, L.—We found this species generally distributed throughout the Kenmare district, but not abundantly. Fairly common near ruins of Muckros Abbey, and in Torc Wood (C. & C.).

Clausilia bidentata, Strom.—Common, and exhibiting more variation in size and coloration than I have ever observed elsewhere. A very small form of var. *tumidula* occurred at Carrigacappeen; also near Torc Cascade (Chaster). A peculiar form was taken by Messrs. Chaster and Hardy on mud-banks on shore of Kenmare River, just below the Southern Hotel, under seaweed and stones covered at high tides. Compared with the type these shells are thinner, more glossy, with finer and closer

set striae (except near mouth), and destitute of the whitish streaks on upper part of the whorls which are present in the type. They have only two principal plications on base of penultimate whorl, and no intermediate folds. The mouth is larger, and the clausilium is broader, thicker, and more deeply tinged with reddish brown at the end and front margin.

Succinea putris, L.—A small-sized form with much expanded lip was common on rushes on banks of Roughty River; and in ditches in meadows near Loo River; Galway's Bridge, and Killowen cromlech (Welch). Very plentiful, richly coloured, and of good size in Lord Kenmare's demesne at Killarney (C. & C.).

Succinea oblonga, Drap.—This interesting and extremely local species was taken on the banks of the river just below Roughty Bridge. Dr. Chaster was the first to make the discovery, which was purely accidental. He was turning over the seaweed in search of beetles, when he came upon a number of specimens congregated together on the damp mud. It seems not improbable that the *Succineæ* had retired to this damp spot to escape the unusual drought which had dried up their wonted haunts. Their discovery affords a good example of the way in which one branch of scientific field work may assist another if the worker pays careful attention to everything that comes under his notice. They also occurred on opposite bank of river, under rushes and long grass covered with sea-wrack. All the shells were thickly coated with a firmly adherent incrustation of mud or sand, very difficult to remove. This is a new county record, and justly considered one of our best captures, indeed it was "first time of taking" to all who were fortunate enough to get it. Mr. R. A. Phillips has kindly furnished the following interesting particulars respecting his captures of *S. oblonga*. He has taken it at Ballincollig (6 miles west of Cork), "several specimens, living, under decaying leaves." Carrigohane (3 miles west of Cork), "frequent, but difficult to find, under stones and plants by the side of the River Lee." Castletown Berehaven (Co. Cork), "one living specimen on bank of small stream about half a mile from the sea." It has also been taken at Baltimore (Co. Cork); Finnoe (Co. Tipperary); and Armagh (Scharft).

Carychium mininum, Müller.—Occurs in all the finer moss-shakings. Both the long and short forms are present. Under stones, Sheen Waterfall; under logs near Loo Bridge; Strickeen Wood (Farran). Common amongst dead beech leaves in Kenmare demesne. Abounds in Torc Woods, Killarney, in company with *Acme lineata* (C. & C.).

Limnæa involuta, Harvey.—Of those who attempted the ascent of the Cromaglaun Mountain on July 9th, none succeeded in reaching the famous Crincaum Lake, except Mr. Cuthbert, and he, during his brief stay, failed to find *involuta*. A few days later, Dr. Chaster and Mr. Collier made another attempt, and not only reached the lake, but were so fortunate as to capture the much coveted mollusc. They have kindly supplied the following interesting account of their experiences:—

"During our stay at Killarney we both determined to make another attempt to investigate the only known habitat for this species, an expedition to which every British conchologist looks forward. Fortunately

we got into communication with one of the boatmen, Pat Coffey, who had been up to the lake some 13 years ago, and having engaged his services to act as guide, and carrier of our impedimenta, and provided with a written permit to traverse the ground, we started by car for the tunnel on the Kenmare road. Dismounting there, we ascended the crest of the mountain with but little difficulty, halting at times to enjoy the magnificent prospect of the lakes, and the heights behind them. On reaching the level plateau a small wood was traversed, and a short walk brought us to the shores of the lake. Almost immediately two specimens were found on a stone in the water. Pat, after a while, hurried up with another. Over two hours' diligent search, under a blazing sun, and with the constant attendance of hosts of cleggs ("Kerry mosquitoes"), resulted in the capture of three more specimens. These, with two dead shells, were all we were able to find. A few egg-masses were seen, each containing about 20 eggs. Regarding both the lake and its remarkable occupant, many erroneous statements have been made, which it may be well to set right. The lake is called on the Ordnance map 'Crincaum.' This name Pat Coffey did not know at all. He assured us that it was locally known as Cromaglaun or 'the shell' lake. Mr. Bendall, in the *Journal of Conchology* for July, 1885, gives its dimensions as 'apparently not more than 20 feet across.' In the following October, Dr. Hill Evans stated that '20 yards would be much nearer the mark.' We carefully paced the tarn, and found it to be about 130 yards long and over 100 wide. The water area will considerably exceed this in wet weather. As regards the animal, Jeffreys, in his 'British Conchology' gives no information beyond the wholly erroneous statement that the mantle covers the shell almost completely, as in *Amphipeplea*. When we reached the hotel with our treasures, they were emptied into a vessel of clean water and carefully watched, and some notes made on the character of the animal which may prove of interest. Colour, uniform olive green, except the mantle, which is mottled with black. Tentacles broad and thin, presenting a slight wide sinuation behind the tip; eyes sessile, small, placed a little in front of the middle of the base of the tentacles. Foot truncated in front, somewhat pointed behind. The mantle is wholly within the shell, and never reflected over its edge so as to cover the shell. The animal is active in its movements, and floats sole upwards with ease. In this position, as well as when crawling, it frequently pauses and rotates the shell rapidly from side to side two or three times."

L. peregra, Müller.—Typical examples near Drumanassig Bridge (Chaster). On mud of Sheen and Roughty Rivers a small form almost identical with var. *Boissyi* was common. This variety occurs generally throughout the district. Var. *lacustris* occurred near Loo Bridge and Lower Lake, Killarney (C. & C.). The species is not at all plentiful in most of the lakes and streams.

L. palustris, Müller.—Typical at Loo bridge. A small thin form near Galway's Bridge (Welch). Small specimens on road to Glengarriff (Hardy). Fairly common in Glenna Bay, Lower Lake of Killarney, but all the specimens were decollate (C. & C.).

L. truncatula, Müller.—Inside the long tunnel on Glengarriff road there are numbers of a very minute form, also some of a larger type on wet rocks near the tunnel, at an elevation of 1,000 feet. Common on mud near Sheen Waterfall; and in a swampy place near Loo Bridge, in company with *Vertigo antivertigo*. Stream near the Tunnel, Upper Lake, Killarney; and in Strickeen Wood (Farran).

Planorbis spirorbis, Müller.—Ditch near Cloonee Lakes. At Muckros and Lower Lakes of Killarney it is fairly common, but of small size (C. & C.)

P. contortus, L.—A few specimens of small size in Glenna Bay, Lower Lake, Killarney (C. & C.).

Ancylus fluviatilis, Müller.—Occurs sparingly in the lakes and mountain streams about Kenmare. Very common at Muckros, and Lower Lake, Killarney (C. & C.). Var. *capuloides*, encrusted with a black deposit, occurred in a small stream running into Auger Lake, Gap of Dunloe (Chaster). Elsewhere all observed were var. *gibbosa*.

Acme ilneata, Drap.—A few typical examples in shakings of moss and *Marchantia* from Mucksna Wood (Standen). Very abundant amongst moss and dead leaves in Torc Woods: many very richly coloured type, and some beautiful var. *alba*; also found near Torc Cascade (C. & C.).

Hydrobia Jenkinsi, Smith.—Mr. Welch found this in abundance, last May, in a stream near Roughty Bridge, and from the smallness of the specimens thought they might possibly be a dwarf form. But we satisfied ourselves that the shells now present in the river are the adult form of the shells seen in May. They are slightly smaller than ordinary, and of a more slender type. The species is extremely plentiful, but only a very small proportion are the carinate variety.

H. ulvæ, Penn.—A few in the Roughty River, in company with *H. Jenkinsi*.

Plisidium pulchellum, Jenyns.—One specimen, Galway Bridge (Welch). Five very beautiful specimens, Upper Lake, Killarney (Standen).

P. nitidum, Jenyns.—Four specimens, Lake Crincaum, Cromaglaun Mountain, Killarney (Collier).

P. fontinale, C. Pfr.—Ditch near "Robbers' Cave," Loo Bridge (Collier). Common, amongst water-lilies, Upper Cloonee Lake. Ditches on each side of Middle Cloonee Lake (Welch). Common on mud of river at Sheen.

P. millum, Held.—Common in Middle Cloonee Lake (Standen). A few on mud of river at Sheen.

P. pusillum, Gmelin.—Large dark specimens in Auger Lake, Gap of Dunloe, Killarney (Collier). Fine fragile specimens, encrusted with iron deposit, in ditch running into Loo River, near Loo Bridge. Ditch near "Robbers' Cave," Loo Bridge. Small specimens on mud of river at Sheen; and a very clean thin form amongst beech leaves in a damp corner of wood on road to Glengarriff. Ditches, Cloonee, and above Sheen (Welch).

Owens College, Manchester.



THE IRISH SPURGE, *Euphorbia hiberna*.

[R. Welch, Photo.



AMONG THE ARBUTUS AT CLOONEEF.

To face p. 227.]

[J. St. J. Phillips, Photo

III.—BOTANY.

BY R. LLOYD PRAEGER, B.E.

Unfortunately, the various departments of cryptogamic botany were almost without representatives in our Kenmare party; and the phanerogamic flora of the district has been so well worked out by Dr. Scully as to leave little scope for fresh discoveries. However, the botanists were well satisfied in finding many of the characteristic plants of Kerry growing in abundance—such as *Saxifraga umbrosa*, *S. Geum*, *Pinguicula grandiflora*, *Arbutus Unedo*, *Euphorbia hiberna*, *Eriocaulon septangulare*, and others.

The day spent at Cloonee yielded *Bartsia viscosa* (meadows above the Middle and Upper Lakes), *Sisyrinchium angustifolium* (between Lower and Middle Lakes, Dr. Fogerty); round about the lakes were *Rhynchospora fusca*, *Drosera intermedia*, *Anthemis nobilis*, and in their waters *Eriocaulon*, *Lobelia*, *Isoetes lacustris*, *Cladium* and *Elatine hexandra*. The islands yielded *Arbutus*, *Juniperus*, *Taxus*.

At the Upper Lake of Killarney many of these plants were seen again. The woods of Derrycunihy yielded *Milium effusum*, *Festuca sylvatica*, both species of *Hymenophyllum*, and abundant groves of *Arbutus*. Under a spreading Oak-tree by the road-side, where the party halted for lunch remarkably fine specimens of *Listera cordata* were gathered, beside a boulder clothed with *Hymenophyllum Wilsoni*.

On Sunday afternoon, *Bartsia viscosa* was gathered again at Carrigacapeen and at Cloghvorragh; at the latter place *Carum verticillatum* was also obtained. Some members who visited the water's edge below the Southern Hotel found *Statice rariflora* and *Scutellaria minor*.

The site of the great bog-burst above Rathmore, which was visited on Monday, was of some botanical interest. The undisturbed bog was dotted over with the blossoms of *Drosera anglica*—to see so great an abundance of open flowers of this species was a novelty to all present. *Carex limosa* was obtained by several members, and *Vaccinium Occycoecos* by Mr. R. D. O'Brien. At Annagh Bridge it was observed that the outpoured peat, which here spread in undrained and undisturbed desolation, was becoming rapidly clothed with a growth of two rushes, *Juncus supinus* and *J. effusus* (? — too young for absolute determination). So far, no other plants had effected a lodging on this inhospitable material.

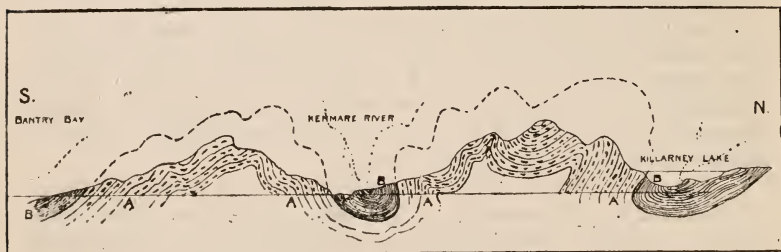
On Tuesday, a halt at Drumanassig bridge on the Sheen River revealed *Sisyrinchium angustifolium* growing in two spots by the river; also abundance of *Carum verticillatum*, *Bartsia viscosa*, and further up the valley *Drosera intermedia*, &c. The rocks near the tunnel at the head of the pass yielded some interesting Saxifrage forms intermediate between *Geum* and *umbrosa*, and also *Hieracium iricum*.

Dublin.

IV.—GEOLOGY.

BY J. ST. J. PHILLIPS.

"The geological structure of the Kenmare District," says Prof. Cole, "is similar to that of the whole South of Ireland, and presents little apparent complication. A long series of folds run east and west, from the fjords of Kerry to Waterford, and, indeed, across Belgium into Central Europe. The troughs or *synclinals* are occupied by Carboniferous Limestone, often with Carboniferous Shale or Slate below; while the ridges, or *anticlinals*, are formed of arches of Old Red Sandstone. With a simplicity of character comparable to that of the Jura Range, the anticlinals have weathered out as long ranges of hills, while the synclinals are channelled down as valleys. The rocks of the ridges that are visible to the traveller are thus the older series, coming up from below along the lines of folding. The Carboniferous strata once stretched uniformly across them, and repeated their folds, having been crumpled with them during the same earth-movements: now they have been worn away, leaving only elongated patches as residues in the less exposed hollows."



SECTION FROM BANTRY BAY TO KILLARNEY.

A. Old Red Sandstone.

B. Carboniferous Limestone preserved in synclinals.

The massive folding of these Old Red Sandstone strata, as seen on the steep side of Boughil and other mountains, were the subject of much admiring comment; but the beds are unfossiliferous, and yield nothing to the palæontologist. Out among the mountains to the north-east of Kenmare occurs an interesting series of volcanic rocks of the same age, which I succeeded in visiting, and obtained many fine specimens of flow rhyolites and felsites.

Numerous striking evidences of severe glaciation were met with in the district. In some places, as at Moll's Gap, 800 feet, (Plate 11), and at Loo Bridge (Plate 3), the slate rocks are beautifully rounded. Elsewhere, perched blocks of great size stand on the hill-sides, lasting monuments of the Glacial Epoch. Two of the finest of these were visited—Cloghvorragh, a huge block of limestone of 400 tons weight, resting on the Old Red Sandstone hill of Knockeirka at an elevation of 250 feet; and Carrigacappeen, a very remarkable erratic of Old Red grit, standing on a 6-foot pillar of Carboniferous Limestone, a striking example of denudation by solution since the Glacial Epoch. (Plate 13).

Belfast.



CARRIGACAPPEEN.

A 30-ton erratic block of Old Red Sandstone resting on a pillar of Carboniferous Limestone.

[*R. Welch, Photo.*]



CLOGHVORRAGH.

An erratic of limestone (400 tons) resting on Old Red Sandstone.
To face p. 228]

[*J. St. J. Phillips, Photo.*]

THE BIRDS OF DUBLIN BAY.

BY CHARLES J. PATTEN, B.A., M.D.,

Chief Demonstrator in Anatomy, Dublin University.

[Read before the Dublin Naturalists' Field Club, April 13th, 1897, and
Dublin University Biological Association, March 4th, 1897.]

It is not likely that any one will dispute the statement that a study of the fauna or flora of a district is always of great importance in the advancement of natural science in general, and more especially field work; not merely because a variety and number of species obtainable in one locality can be compared favourably or otherwise with that obtainable in some other place, but from the fact that when a complete list of birds, etc., is furnished and studied the further observation of rarer species is facilitated—that is to say, when we have carefully investigated the contents of a certain district, then we are eager to discover something fresh.

Perhaps this may be quite reason enough for bringing forward such a communication as the present, which at first might seem to lack sufficient interest. However, instead of simply enumerating the species which are found about Dublin Bay, it has been the aim of the writer to introduce some practical hints which may assist the observer and collector in their studies on the swamp and sea-shore. For this end brief descriptive notes have been appended.

The greater number of birds frequenting Dublin Bay belong to the large class of Grallatores or “waders,” inhabiting or visiting the extensive mud-slobs and sand-banks which constitute the North Bull off Clontarf. Still were we to omit the web-footed and land birds frequenting these parts, our avifauna would be far from complete. It therefore seems advisable to draw up a complete and systematic list of every species of bird which has frequented the bay, and at the same time to follow the nomenclature of the 4th edition (by Newton and Saunders) of Yarrell's *British Birds*.

It would be impossible to compile a purely original fauna, if we wish it to be complete. Already many ornithologists have recorded from time to time the appearance of rare birds

in Dublin Bay. These records must re-appear in the present paper. Such being the case, the writer has freely consulted the publications of the late Mr. A. G. More, and of Thompson, Watters, Yarrell, Williams, Morris, etc., as well as periodicals, such as the *Irish Naturalist* and *Zoologist* for some years back. Still, most of the facts recorded in this list of birds from Dublin Bay, are the result of close personal observation, made for the past ten years, helped by information from Mr. E. Williams, who has always made shore-birds a special study. Shore-birds afford a peculiarly fascinating study to the ornithologist, and yet little is known about their habits beyond such broad facts as that they are migratory for the most part, gregarious, and swift of flight. Indeed many observers cannot discern *on the shore* between the different species of such common genera as *Tringa* and *Totanus*.

The want of positive knowledge on this particular branch of ornithology, depends for the most part on the fact that the large majority of "waders" can only be approached with extreme difficulty. Their peculiar environment, consisting as it does of large open mud-flats, devoid of cover, very soon teaches them to become wary and suspicious, and even when approached, the rapidity with which they run often takes them from proper observing range. Again, some shore-birds are edible (Plovers, Curlew, etc.), and are eagerly sought for by the sportsman, which, of course, increases the shyness of the birds; moreover, many non-edible species (Redshanks, Godwits, etc.), keep company with the former and thus acquire their timid habits. Another reason which adds to the difficulty in determining different kinds of wading birds is the uniformity in the colour of their plumage.

Indeed, with few exceptions (Sea-pie, Ringed Plover, and one or two others), grey is the predominating shade of the feathers, and the perfect harmony which this presents to the sand of the sea-shore often renders it a hard task to discern these birds, although they may be close at hand. Lastly, shore-birds are not song-birds. True it is they possess characteristic notes, generally cries of alarm, often plaintive in nature; but, when undisturbed, "waders" are usually rather silent. Hence the unnoticed observer gains little or no help from the voice of these birds.

In concluding these remarks let me offer a few suggestions which may prove of service to the ornithologist on the sea-shore :—

Firstly :—Let the colour of your dress correspond as much as possible to that of the sea-sand. Secondly :—Learn to assume an innocent gait when approaching “waders” (the attitude of a cockle-picker, or of a marine botanist, often proves useful). At any rate do not sneak along the shore in a suspicious manner as if on murderous intent. Thirdly :—If the birds are approaching you, crouch low and remain perfectly still. Fourthly :—Never bring a dog with you. Fifthly :—Try and have a good sound practical knowledge of the various species before you commence to collect, and avoid using a gun unless you actually want to preserve a specimen.

Order ACCIPITRES.

Pandion haliaetus, Linn. OSPREY.—Extremely rare and accidental visitor. Has been once obtained by Mr. W. Williams. This specimen is in the National Museum, Dublin (*Life and Letters of A. G. More*, p. 579, and *List of Irish Birds*, by A. G. More, p. 5.) A large powerfully-built bird which preys upon fish snatched from the surface of the water.

Falco peregrinus, J. F. Gmel. PEREGRINE FALCON.—Occurs every autumn in small numbers; probably birds of the first year from the cliffs of Lambay Island. Easily distinguished from the other common Irish hawks by its superior size, very dark back, and short tail.

F. æsalon, Gmel. MERLIN.—Regular autumnal visitor, appearing during the month of September. Feeds on the Dunlin (“Sand Lark”), which it chases with marvellous rapidity. The Merlin is the smallest Irish hawk, and differs from the Sparrow-hawk by its longer wings and shorter tail, and from the Kestrel by its darker back, smaller size, and more rapid flight.

Asio accipitrinus, Pallas. SHORT-EARED OWL.—Autumnal visitor, appearing towards the end of October (Williams). Frequents the dry sand-dunes of the North Bull. Often hunts by day, differing in that respect from the Long-eared Owl, which is strictly nocturnal in its habits.

Order PASSERES.

Ruticilla titys, Scopoli. BLACK REDSTART.—Has been noticed on several occasions at the “North Lots” in winter by Mr. E. Williams. Resembles the Wheatear in habits, but the latter is a summer migrant, and much lighter in colour.

- Saxicola œnanthe**, Linn. WHEATEAR.—Common summer migrant. Breeds among the sand-holes of the North Bull. This bird is distinguishable from other passerine birds by the conspicuous white patch at the base of its tail, and its peculiar habit of flying along the tops of stone walls, rocks, etc. Hence its generic name.
- Motacilla lugubris**, Temm. PIED WAGTAIL.—Resident and common. Often collects into large flocks in autumn and winter. Characters familiar.
- Anthus pratensis**, Linn. MEADOW PIPIT, "TITLARK."—Plentiful all the year round about the grass and sand-dunes of the North Bull, where it breeds.
- A. obscurus**, Lath. ROCK PIPIT.—Frequent about the rocks of the Bull Wall. Distinguished from *A. pratensis* by its darker colour and larger size.
- Alauda arvensis**, Linn. SKY-LARK.—Common all the year round, breeding in the grass and sand-dunes. Characters familiar.
- Plectrophanes nivalis**, Linn. SNOW BUNTING.—Regular winter visitor in small numbers. Habits gregarious. Distinguished when flying from other small birds by the beautiful white wings. Mr. E. Williams informs me he has seen 150 birds in a flock.
- Sturnus vulgaris**, Linn. STARLING.—Common about the grassy slopes and sandhills. Characters familiar.
- Corvus frugilegus**, Linn. ROOK.—Common at all times. Characters familiar.
- C. monedula**, Linn. DAW.—Common at all times. Characters familiar.
- Hirundo rustica**, Linn. SWALLOW.—Plentiful in the summer. Characters familiar.
- H. urbana**, Linn. HOUSE-MARTIN.—Common in the summer, but less plentiful than the Swallow, from which it may be distinguished flying by its smaller size, and white patch over the tail.
- Cotile riparia**, Linn. SAND-MARTIN.—Common in the summer, but less plentiful than the last species. Distinguished by its inferior size and chestnut brown back.

Order PICARLÆ.

- Cypselus apus**, Linn. SWIFT.—Common in the summer, leaving the country about the end of August.
- Caprimulgus europæus**, Linn. NIGHT-JAR.—Rare summer visitor, but has been obtained on different occasions from the North Bull (Williams). Habits nocturnal. Distinguished from all the owl family by its small size and more proportionate length of tail. The voice when produced at once characterizes this bird.
- Alcedo ispida**, Linn. KINGFISHER.—A few have occurred at the entrance of a small stream into the salt-water channel which runs up the mud-slobs of the North Bull. Its splendid tropical plumage at once distinguishes it from all other Irish birds.

Order COLUMBÆ.

Columba palumbus, Linn. RING - DOVE, "WOOD - QUEST."—Common all the year round. Characters familiar.

C. livia, Gmel. ROCK-DOVE.—Has occurred on few occasions (Williams). Differs from last by smaller size, and absence of white on neck and wing.

Order LIMICOLÆ

Œdicnemus scolopax, S. G. Gmel. STONE CURLEW.—Extremely rare visitor to Dublin Bay. Has twice occurred on the North Bull, viz.:—27th January, 1829 (Morris, *British Game-birds and Wild-fowl*, p. 117), and on the 3rd December, 1884. The latter specimen is preserved in the National Museum, Dublin (*Life and Letters of A. G. More*, p. 598, and *List of Irish Birds*.) The Stone Curlew is a member of the plover family, and is often called the Great Plover; it is distinguished from the other Irish species by its superior size.

Ægialitis hiaticula, Linn. RINGED PLOVER.—Plentiful on the North Bull in autumn and winter. Many remain to breed on the end of the sand-dunes. The white ring round the neck with the black and white forehead make this a very noticeable little bird. It often keeps company with the Dunlin, and like it is the least suspicious of shore birds.

Æ. cantiana, Lath. KENTISH PLOVER.—Extremely rare. Has only been met on few occasions on the "muddy shores of Dublin Bay," viz.:—Autumn of 1846 (Thompson); in August, 1851, and winter of 1852 (Watters, *Birds of Ireland*). A specimen in the Science and Art Museum is recorded by the late Mr. A. G. More, in his *List of Irish Birds*, 1890. Distinguished on the shore from last by its smaller size, and incomplete black ring round the neck, which is interrupted in front by a white patch. Legs and bill black. In the Ringed Plover the legs and base of the bill are orange.

Charadrius pluvialis, Linn. GOLDEN PLOVER.—Annual visitor to the North Bull in late autumn and winter.

Squatarola helvetica, Linn. GREY PLOVER.—Annual visitor in small numbers to the North Bull, arriving in September and remaining throughout the winter till spring. Mr. Williams noticed a Grey Plover at the early date of 28th August, 1898, in full summer plumage. The bird may be distinguished from the Golden Plover when flying, by the conspicuous white-marked tail, and by the black axillary feathers. The dead specimen can always be recognised by the obsolete hinder toe. This is absent altogether in the Golden Plover. The autumnal plumage of the Grey Plover in its first year shows a golden tinge in the upper wing coverts and back feathers. In winter this is replaced by a true grey colour.

Vanellus vulgaris, Bechst. LAPWING, GREEN PLOVER.—Common on the North Bull, where it breeds. Characters familiar.

Streptopelia interpres, Linn. TURNSTONE.—Frequent on the coast of Dublin Bay, except in summer, when a few non-breeding birds occur. The peculiar variegated, blotched plumage, consisting of black, white, and chestnut, characterizes this species on the sea-shore. Its partiality for hard ribbed sand and shingle should also be noted.

Hæmatopus ostragalus, Linn. OYSTER-CATCHER.—Common at all times. Easily identified by its large size and black and white plumage. Hundreds often flock together.

Recurvirostra avocetta, Linn. AVOCET.—Extremely rare visitor. One was observed by Mr. E. Williams in Oct., 1897, at the North Bull. The characteristic recurved beak, white plumage with black wings and head, and long legs will serve to distinguish this bird.

Phalaropus fulicarius, Linn. GREY PHALAROPE.—Rare and irregular visitor in autumn (Williams). Predominating colour is ash-grey. Feet with lobe-webbed toes.

Gallinago cœlestis, Frenzel. COMMON SNIPE.—A few frequent the rushes of the North Bull. Characters familiar.

Tringa alpina, Linn. DUNLIN, "SAND-LARK."—Plentiful about the mud-slobs and salt-water drains of the North Bull. Occurs all the year round but is most numerous in autumn and winter, when it collects into large flocks. The small wisps which occur throughout the summer months consist for the most part of non-breeding birds as shown by anatomical investigation. In summer the lower breast of the Dunlin is black, and the back darkish brown. The birds of the first autumn are brownish throughout and have no black on the breast. In winter the Dunlin fades to a pale ash-grey with white breast. The bills, legs, and toes are black.

T. minuta, Leisler. LITTLE STINT.—Irregular autumnal visitor in small numbers, generally appearing about the first week in September. In 1892 there was an unusually large migration to the North Bull. On the 7th Sept. of that year, in company with Mr. E. Williams, I observed no less than sixty Stints. Most of them were mixed up with small flocks of Dunlins, others kept company with Sanderlings and Turnstones, whilst the remainder aggregated into small batches of 15 or 20 birds. They only remained a few days, for on the 12th Sept., 1892, they had all departed. From 1893 to 1896 inclusive no examples of Stints made their appearance. Last year (Sept. 1897), Mr. Williams obtained one, and I obtained a pair of these birds from the North Bull. It may be distinguished from the other small waders by its diminutive size, very straight flight, and by its voice, which is a delicate high pitched twitter. The bill is shorter and straighter in proportion to that of the Dunlin.

Tringa subarquata, Guld. CURLEW SANDPIPER.—Occurs nearly every autumn (Sept.) in varying numbers, leaving before the winter. May be distinguished from the Dunlin by its superior size and its longer and more curved bill. When flying, the light colour over the lower back also distinguishes the bird. This part is dark in the Dunlin.

T. canutus, Linn. KNOT.—Common in autumn and winter. Distinguished from the last species by its larger size, stouter build, and shorter legs. The feathers of the back of the young birds, in their first autumn, are tipped with yellow. In winter this fades away to ashy grey.

Calidris arenaria, Linn. SANDERLING.—Frequent on the North Bull in autumn, winter, and spring. A few non-breeders in summer plumage are often seen in July and August. At this time of the year the feathers of the back are richly marked with chestnut, black, and grey. The young autumn birds have their back spotted with black and white. In winter the plumage changes to a pale ash-grey. The Sanderling may be distinguished from the Dunlin by its large size, and in the winter by its lighter colour. Its preference for hard ribbed sand instead of mud-slobs should be noted. When killed, the absence of the hinder toe at once distinguishes it from all other small grey-coloured "waders."

Machetes pugnax, Linn. RUFF.—Very rare autumnal visitor. A pair were obtained by Mr. E. Williams on the 28th August, 1897. These were in the immature plumage. The Ruff is taller than the Redshank, and the predominating colour is chestnut brown. The characteristic frill of the breeding plumage at once distinguishes the bird in summer.

Tryngites rufescens, Vieill. BUFF-BREASTED SANDPIPER.—Native of America. Has once occurred at the Pigeon House, Dublin Bay (Thompson, vol. ii., p. 302.) This specimen is in the National Museum of Dublin (see also *List of Irish Birds*, by late A. G. More, p. 25.)

Totanus hypoleucus, Linn. COMMON SANDPIPER.—Regular summer visitor, retiring inland to breed. An easily recognised bird, from its habit of nodding its head and jerking its tail when it alights. Frequently met with along brooks and rivers.

T. calidris, Linn. COMMON REDSHANK.—Plentiful on the coast in autumn and winter. Prefers soft sea-mud to clear sand and shingle. Characters familiar, voice characteristic.

T. fuscus, Linn. SPOTTED REDSHANK.—Very rare autumnal visitor. Two occurred in September, 1888. Again, in September, 1890, a specimen was shot at the Bull; and on the 7th September, 1894, Mr. Williams drew my attention to a specimen which flew by us on the North Bull (E. Williams in *Irish Naturalist*, vol. iii., p. 224.) The Spotted Redshank can be distinguished when flying from the common species by the absence of the broad white bands on the wings.

Totanus canescens, Gmel. GREENSHANK.—Occasionally seen on the North Bull in autumn and winter. Resembles the Redshank in flight, but is one-third larger. The voice consists of four notes, each of which receives equal emphasis. The voice of the Common Redshank consists also of four notes, but the first two receive greater accentuation.

Limosa ægocephala, Linn. BLACK-TAILED GODWIT.—Very rare autumnal visitor.

L. lapponica, Linn. BAR-TAILED GODWIT.—Regular visitor in autumn, remaining till spring. A specimen was obtained last year as early as August 11th, by Mr. Williams. The Godwits are sombre-plumed greyish-brown birds, distinguished by their intermediate size between Redshanks and Curlew, and their long slightly recurved beaks.

Numenius arquata, Linn. CURLEW.—Abundant on the coast in autumn and winter. Characters familiar. Bill decurved.

N. phæopus, Linn. WHIMBREL.—Occurs in autumn and spring, collects into flocks in May. Inferior in size to the Curlew, but resembles it in flight. Bill decurved.

Order GAVIÆ.

Hydrochelidon leucoptera, Linn. WHITE-WINGED BLACK TERN.—Has been recorded twice from Dublin Bay, viz.:—October, 1841 (*Saunders' Newsletter*, April 14, 1847) and another recorded by Thompson (*Birds of Ireland*, iii., p. 307) without a date. See also Yarrell, iii., p. 522. The colour of the bird is sufficient to distinguish it.

H. hybrida, Pallas. WHISKERED TERN.—Has once occurred in Dublin Bay in September, 1839 (Thompson. See also *Life and Letters of A. G. More*, p. 603, and Yarrell, vol. iii., p. 528). Distinguished by the white streak on the side of the face (whisker).

Sterna fluviatilis, Naum. COMMON TERN.—Generally occurs about Dublin Bay every autumn,

S. macrura, Naum. ARCTIC TERN.—Irregular visitor in autumn prior to migration. Several occurred and some examples were secured on the 14th September, 1894. It is not possible to distinguish the Arctic from the Common Tern on the wing. The following differences can be made out in the dead specimens:—

COMMON.

In summer, bill red and black.
Tarso-metatarsus longer than in Arctic Tern.
Band on under side of wing primaries dark in colour.
Fork of tail shorter.

ARCTIC.

In summer, bill dull red.
Tarso-metatarsus shorter than in Common Tern.
Band on under side of wing primaries light in colour.
Fork of tail longer.

Sterna minuta, Linn. LESSER TERN.—Frequent on North Bull in summer, and remaining to breed during some seasons; may be distinguished from previous two species by its inferior size. The Terns may be distinguished from the Gulls by their smaller bodies, short legs, very small feet, long pointed wings, forked tails, and quicker and more beating flight.

Larus ridibundus, Linn. BLACK-HEADED GULL.—Common in Dublin Bay all the year round. After the autumn moult the plumage of the head becomes white. The young have splashed patches of brown on their back. Legs and beak of adult deep red.

L. canus, Linn. COMMON GULL.—Abundant in autumn and winter. A few non-breeding examples remain throughout the summer as shown by anatomical investigation. This summer (1898) there was an unusually large number of non-breeding Common Gulls in Dublin Bay. The birds of the first year are dun colour. The adult in summer has a pure white head in winter; it is speckled grey. Feet and beak green.

L. argentatus, Gmel. HERRING GULL.—Plentiful at all times. Characters familiar. Young dark greyish brown all over.

L. fuscus, Linn. LESSER BLACK-BACKED GULL.—Common, but not numerous, all the year round. Characters familiar. Head becomes speckled in winter.

L. marinus, Linn. GREAT BLACK-BACKED GULL.—Often found in the bay but never numerous. Distinguished from last species by its superior size. Head becomes speckled in winter.

L. glaucus, O. Fabricius. GLAUCOUS GULL.—Very rare and uncertain visitor to Dublin Bay. A fine specimen was shot on the 14th September, 1894, by Dr. N. H. Alcock, at the North Bull (*vide Irish Times* and *Daily Express*, September 20, 1894). The large size of this bird and the absence of black tips on the primary wing-feathers at once distinguish it at any time of year. The colour of the young bird is a light faintly speckled yellowish grey; the old bird gradually turns white.

L. tridactyla, Linn. KITTIWAKE GULL.—Common all the year round preferring deeper waters than the other species. In summer the plumage is identical with the Common Gull, but the legs of the former are blackish and shorter in length. The young Kittiwake is splashed on the back with black feathers. The head of the adult in winter turns greyish blue.

Xema sabini, J. Sabine. SABINE'S GULL.—Extremely rare. Has once been recorded by Mr. Thompson subsequent to 1833 (Yarrell's *British Birds*, iii., p. 574). This specimen is in the National Museum. Known by its forked tail.

Stercorarius catarrhactes, Linn. GREAT SKUA.—Very rare visitor in autumn. One recently obtained from Dublin Bay is in the Science and Art Museum (*Life and Letters of A. G. More*, p. 604, and *List of Irish Birds*, p. 28).

Stercorarius pomatorhinus, Temminck. POMATORHINE SKUA.—Irregular visitor to Dublin Bay in autumn.

S. crepidatus, Gmel. RICHARDSON'S SKUA.—Occurs irregularly in the autumn.

S. parasiticus, Linn. BUFFON'S SKUA.—Autumn visitor, but much rarer and smaller than the preceding species. The Skuas are strongly built dark birds of predaceous habits, chasing Gulls and forcing them to give up their food. They also feed on small water-birds and eggs.

Order TURBINARES.

Puffinus anglorum, Temminck. MANX SHEARWATER.—Common in the bay, preferring deep water. Easily distinguished from the Razorbill and Guillemot by its more pointed wings and more buoyant flight.

Order PYGOPODES.

Alca torda, Linn. RAZORBILL, "DIVER."—Common in Dublin Bay. Characters familiar.

Urula trolle, Linn. COMMON GUILLEMOT, "DIVER."—Common in Dublin Bay. Characters familiar. Larger than preceding species.

Fratercula arctica, Linn. PUFFIN.—Common in summer. Characters familiar. Smaller than Razorbill. A specimen picked up on the Bray strand on 2nd January, 1891, is in the author's private collection. This bird is very rare in winter (*vide Daily Express*, Jan. 6, 1891).

Colymbus glacialis, Linn. GREAT NORTHERN DIVER.—Often occurs in winter and spring. A large bird with handsome variegated plumage.

C. arcticus, Linn. BLACK-THROATED DIVER.—Much rarer than last, but occurs occasionally in winter and spring. Distinguished by the colour of its throat.

C. septentrionalis, Linn. RED-THROATED DIVER.—Commoner than last and frequently occurring in winter and spring. Throat reddish.

Order STEGANOPODES.

Phalacrocorax carbo, Linn. CORMORANT.—Common at all times. Characters familiar.

P. graculus, Linn. SHAG.—Frequent in Dublin Bay. Resembles the Cormorant, but is smaller in size.

Order HERODIONES.

Ardea cinerea, Linn. HERON, "CRANE."—Common at all times. Characters familiar.

Order ANSERES.

- Bernicla brenta**, Pallas. BRENT GOOSE.—Common on the mud-slobs of Clontarf in winter. Easily distinguished by the predominance of black in its plumage.
- Tadorna cornuta**, Gmel. COMMON SHELDRAKE.—Frequent on the North Bull and mud-slobs of Clontarf in autumn and winter. Often collects into large flocks. Easily recognised by the broad chestnut "shield" round the neck.
- Anas boscas**, Linn. WILD DUCK.—Occurs in winter about the North Bull and Dublin Bay. Characters familiar.
- Spatula clypeata**, Linn. SHOVELLER.—A few occur in winter about Dublin Bay (Williams.) Bill characteristic.
- Dafla acuta**, Linn. PINTAIL.—Occasionally found in winter. Tail of the drake is characteristic.
- Querquedula crecca**, Linn. COMMON TEAL.—Frequent in winter. Characters familiar.
- Mareca penelope**, Linn. WIGEON.—Common in winter. Characters familiar.
- Fulligula marila**, Linn. SCAUP.—Head black like that of the Tufted Duck and Golden-eye, but the grey back of the Scaup at once distinguishes it. Frequent in winter (Williams).
- F. cristata**, Leach. TUFTED DUCK.—Occasionally occurs in Dublin Bay in winter (Williams.) Colour—black beak, white breast. Head tufted. Irides orange.
- Clangula glaucion**, Linn. GOLDEN-EYE.—Like the last, occasionally occurs in winter. Distinguished from the Tufted Duck by the white patch on the side of the cheek, and the yellow and black legs. Irides orange.
- Somateria spectabilis**, Linn. KING EIDER.—Has once occurred, viz. :—at Kingstown, October 1, 1837 (Thompson, in Morris's *British Game-birds*, p. 249, and *Life and Letters of A. G. More*, p. 613). A large heavy bird with vermilion-coloured beak and feet. In the adult male the neck and chest are light-coloured, and the back and abdomen dark.
- Ædemia nigra**, Linn. COMMON SCOTER.—Occurs occasionally in Dublin Bay. Colour black.
- Æ. perspicillata**, Linn. SURF SCOTER.—Extremely rare. Has been obtained once at Clontarf in October, 1880 (Sir R. Payne-Gallwey in *Fowler in Ireland*, p. 113, and *Life and Letters of A. G. More*, p. 613.) Colour black, with patches of white on the head.
- Mergus merganser**, Linn. GOOSANDER.—Rare. Occurs chiefly in severe winter weather (Williams). Bill thin and serrated. Feathers on head form a crest.
- M. serrator**, Linn. RED-BREASTED MERGANSER.—Common in winter. Bill also serrated, but feathers of the head form a much longer crest than those of the preceding species.
- Trinity College, Dublin.

THE FLORA OF DONEGAL.

Flora of the County Donegal, or List of the Flowering Plants and Ferns with their localities and distribution. By HENRY CHICHESTER HART, B.A., T.C.D., M.R.I.A., &c. Dublin: Sealy, Bryers, and Walker. London: David Nutt. 1898. 8vo. xxiv. + 392 pp. Map. 7s. 6d.

Mr. Hart's long-promised and long-expected work has at length appeared, and not only Irish but English and European botanists are to be congratulated on possessing a full and masterly account of the flora of Donegal, a county which must rank with Kerry and Galway as one of the most interesting districts of Ireland. Mr. Hart's long sojourn in and intimate knowledge of Donegal rendered him peculiarly fitted for the task which A. G. More, many years ago, induced him to undertake, and which has now been brought to a successful conclusion. It is thirty-three years since he collected his first Donegal plant, and in the intervening period he has explored every mountain and valley, cliff and lake.

When *Cybele Hibernica* was published in 1866, Donegal was a *terra incognita*. Prof. E. Murphy and Admiral Jones had done some botanizing there, and More had listed the plants of the Killybegs neighbourhood, but only two-thirds of the present flora was then on record; the remaining third, which has been added almost entirely by the researches of Mr. Hart, embraces many of the most interesting plants of the county.

Urged by the stimulating encouragement of More, and assisted by grants from the Royal Irish Academy, Mr. Hart began a systematic exploration which was steadily continued for many years, the more interesting result being published in a series of papers in the *Proceedings* of the Academy and in the *Journal of Botany*. The valuable additions to our knowledge which these papers contained, together with a very large amount of unpublished observations, are now presented to us in orderly and concrete form.

The flora of Donegal has long been known to be of high interest. The rugged mountains of Cambrian and Ordovician rocks which cover so large a portion of its surface are rich in alpine plants—as Irish mountains go; and, as might be expected from their northern position, the alpine plants which these mountains harbour descend to lower levels than elsewhere in Ireland. Then we have representatives of the southern group of plants which render the South-west and West of such intense interest to the botanist. Many of this group die out before the northern latitude of Donegal is reached, but others—the London Pride, Irish Spurge, Killarney Fern, Maiden-hair, and with them the American Pipewort—range into the most northern county in Ireland. These special features, coupled with a general vegetation of varied and extensive character, combine to render the flora of Donegal one of the richest and most interesting in Ireland. To show the distribution in the

county of its plants, Mr. Hart has used the scheme of partition which is supplied by the baronies, the large barony of Kilmacrenan being divided into two by a north and south line. Eight districts are thus formed, and the distribution of the whole flora in these eight districts has been conscientiously worked out, and is shown in detail in a table which also gives the type of vegetation (Watson's) to which each species belongs, and its vertical range in Donegal, indicated by reference to Watson's zones. Indeed, the vertical distribution of the flora has received particular attention, and no part of the work is more thorough than the information given on this important subject.

To analyse the contents of the book. A large folding map of the county faces the title-page—perhaps rather larger than was necessary for the amount of detail which is shown on it. This map is not quite as accurate or as clear as might be desired. Mulroy Bay, an arm of the sea, appears as a land-locked lake. The railways from Donegal to Killybegs, and from Stranorlar to Glenties, which have been open for some years, are not shown, although other railways are duly marked. It is difficult to find the many lakes, owing to their being coloured like the land surrounding them; and the marking of the mountains is such that one might suppose the whole county to be nearly equally hilly, except where the more important elevations are marked in feet. Following the title-page (which is not quite explicit, as “Horsetails, Club-mosses, and *Characeæ*” ought to be added to “Flowering Plants and Ferns”) we have an appropriate dedication to the memory of A. G. More. Then comes a four-page “Introduction,” which is what, in works of its kind, is usually styled a preface, and in which the author explains the origin and history of the book, with a grateful acknowledgment of the sympathy and assistance received from More. A full index follows, in which the names of orders and of genera, and English names, are wisely thrown into one alphabetical list. Then come chapters on topography, geology, flowering season of plants, geographical distribution, and table of descending order of plants, occupying 89 pages. These subjects are all well worked out. But here we first encounter a looseness of editing and also a carelessness of proof-reading, both of which become more apparent as one dips deeper into the book, and which mar certain portions of it. “Quartzose” for “quartzite,” repeated several times, is not an improvement, and “glaciated striæ” sounds peculiar. On p. 5, in the list of “plants occurring only in this district” [South Inishowen], *Leontodon hispidus*, *Calamintha Clinopodium*, and *Poa compressa* are included without comment, though from the body of the book we learn that the occurrence of the first in the county is “very doubtful,” while the others, though searched for, have not been seen in their only station for over half a century. To take another instance, *Linaria repens* and *Euphorbia amygdaloides* are included (p. 7) in the list of “undoubted natives found only in District III.” whereas in the detailed enumeration of the flora both are marked with a dagger (= “possibly introduced”). *Eleocharis pauciflorus*, *Thrincia* and *Apargia* in this portion of the book develop into *Scirpus* and *Leontodon* later on. These are small things, but they militate against the symmetry of the work.

A more serious fault, and indeed one of the very few things in the book to which we must really take exception, is the fact that the information given is not always up to date. For instance, in the comparison between the floras of Donegal and Derry (p. 59), *Mysotis collina*, *Carex stricta*, *C. riparia*, *Trisetum*, and *Ceterach* are included in the list of "species occurring in Donegal, but not in Derry." All of these are known to occur in Derry, and have been on record from that county for some years, in this Journal, or in the *Proceedings* of the Belfast Field Club. Similarly, *Meconopsis cambrica* and *Carex paludosa* should be added to the list of Derry plants not in Donegal (p. 58). Again, *Hieracium Somerfeltii*, *H. gothicum*, *Carlina*, *Polygonum Bistorta*, *Carex filiformis*, *Schlerochloa rigida*, *S. loliacea* are listed as "in North-west [Donegal], but not in North-east" [Antrim and Derry]. These all have been recorded from Antrim or Derry. The remarks on certain north-eastern plants on pp. 65-66 are similarly misleading. *Galium Mollugo* of the north-east has been shown to be *G. erectum* so far as observation has gone; the former cannot at present be included in the north-eastern flora. *Utricularia intermedia*, *Rumex Hydrolapathum* and *Carex paludosa* have been found recently, and published. *Carex teretiuscula* was found in Derry as far back as 1894, and published. *Milium effusum* is in Antrim. *Triticum caninum* has been definitely recorded. The note on *Draba incana*, too, is misleading. Since the "small and scarce" note was published (*J.N.*, Feb., 1894—not Jan.) it has been recorded as "abundant and fine" (*Proc. B.N.F.C.*, 1894-95.) *Senebiera didyma* and *Lavatera arborea* (p. 72) do reach the north of Ireland (Antrim)—the latter as native there as anywhere else. *Nasturtium palustre* should be added to the list on p. 61. *Carex pauciflora* as an Irish plant is altogether ignored. In a word, the author has not paid the same attention to the recorded flora of District XII. as to the unrecorded flora of District XI.; but in view of the minute comparisons into which he enters he ought to have done so. All the records above referred to may be found in the *Irish Naturalist*, or in the publications of the Belfast Field Club.

We now come to the main part of the work, and the most important—the detailed list of plants, with localities, elevations, &c., which occupies 188 pages, or a little less than half the book. Here Mr. Hart is at home, and the information is as clear and full as could be desired. It is this portion of the work that best exhibits the vast amount of field-work carried out, and the close observation of the worker.

Among the quotations of localities will be found many interesting observations on the habitats and range of the plants, on their standing as natives, on old and doubtful records, and on segregate or critical forms. The working out of segregates is somewhat irregular. *Rubus* and *Hieracium* are given in detail, but *Arctium* is "lumped" under *A. Lappa*, and *Euphrasia* similarly. The nomenclature is chiefly that used in the first edition of *Cybele Hibernica* (1866), and however one may object to modern name-juggling, a number of these appellations certainly cannot stand. The effect of the introduction into the list of a number of modern names of segregates or critical plants among the familiar and convenient—if out of date—names of thirty years ago, is peculiar. It is gratifying to find frequent notes by our best critical botanists quoted

with regard to critical forms. Mr. Arthur Bennett, Mr. Hanbury, and the late Prof. Babington have been constantly consulted, and have given their usual generous aid. The Hawkweeds Mr. Hart has especially sought for, and Mr. Hanbury has himself visited Donegal. The result is the publication of the best Hawkweed list yet made out for any part of Ireland. *Characeæ*, on the contrary, have been manifestly neglected, only three species of this order being recorded. We note that several Donegal records for *Characeæ* published in this Journal by Messrs. Groves have been omitted; nor are these the only recently published records of Donegal plants which do not find a place in Mr. Hart's *Flora*, though, so far as we have observed, the omissions are not serious. The list of Sedges is a rich one, no less than 38 species being recorded. This portion of the book—the “*Flora*” proper—is well arranged and exceedingly interesting. Its only fault is its far too frequent typographical errors. *Erysimm*, *Gensta*, *cærpilosa*, *cerinthifome*, *Bœninghausenia*, *district* (for *distinct*), *Aspleium*, *Isoetis*, are a few of them.

The date of More's “Recent Additions” is variously quoted as 1872 and 1886, and of Dickie's *Flora of Ulster*, as 1864, 1866, and 1886; the name of one of his correspondents is variously spelt *Gwynn* or *Gwynn*; *C. More* appears for *C. Moore*, and *A. G. Moore* for *A. G. More*.

We notice here, too, at intervals, the same neglect of recent botanical work, of which we have before complained. For instance, *Utricularia neglecta* is stated to have been “only very recently discovered in Ireland by Mr. Scully, in the Co. Kerry.” It was discovered there ten years ago, and has since been recorded by Mr. Colgan from Co. Dublin. *Trollius europæus* “confined to Donegal in Ireland;” W. M'Millan's Fermanagh record (*J.N.*, v., 188), cannot be altogether ignored. *Plantago media* has several recent records besides those quoted *Juncus obtusiflorus* can no longer be reckoned among the rarer Irish plants.

The essay on climate which is appended has for its only fault its length. The many pages of tables of temperatures, &c., over the whole of the British Isles strike us as out of place in a work of the kind. A sweeping curtailment of the 60 pages devoted to this subject (we are told that the large type in which it appears was due to a mistake), and the substitution instead of a larger type in the body of the work would have vastly improved the book. By a strange perversity, that portion which will ever be most consulted has been allowed the smallest type. The book concludes with an interesting glossary of Donegal plant-names and plant-lore, a subject often neglected in local floras.

The “*Flora of Donegal*” will be warmly welcomed, and its author deserves all congratulations on its production. The possession of the volume signifies an immediate large accession to our knowledge of Irish botany. The best feature of the book is the care with which distribution both horizontal and vertical has been worked out; the worst omission the complete absence of any history of Donegal botany, or bibliography, of that subject.

BIRD SONGS.

A Dictionary of Bird Notes. By CHARLES LOUIS HETT. Brigg : Jacksons, Market Place, 1898.

A dictionary of the notes of birds is a new departure in ornithology, and may at least be pronounced a highly interesting experiment. Its aim, we are told in a short preface, is to facilitate the identification of birds by their songs and calls; and if bird-notes could be syllabled with sufficient accuracy to insure their recognition when heard, the idea of presenting them in dictionary form would be an excellent one in every sense. Unluckily our ornithological literature abounds in illustrations of the virtual impossibility of fulfilling this condition. Mr. Howard Saunders describes as a shrill "ki-ou" a note which the late Mr. Seebohm syllabled as "ahp"; and when such authorities differ thus widely, we need not expect agreement to be the prevalent rule. The syllabing even of the Cuckoo's cry is, as Mr. Hett admits, partly fanciful. The Redwing's alarm, rendered as "quip" in the book before us, might also be written "wok." And who could guess under what letter to begin his search for the hurried trill of the Corn Bunting, or the purling call-note of the Lark? A year ago a correspondent in the *Field* asked what bird had a note like a pig's grunt. He received three answers, and his bird was identified as (1) the Stock Dove, (2) the Lesser Pied Woodpecker, and (3) the Long-eared Owl. In Mr. Hett's dictionary no grunting note is ascribed to any of these three species, but we are referred, under "grunt," to three other birds, namely, the Common and Black Guillemots, and the Razorbill. We have heard the opinion expressed by an Irish ornithologist, that the bird which really had puzzled the inquirer on the above occasion was a Mistle-Thrush. So much for the safety of phonetic guidance. And turning over the pages of the Dictionary of Bird Notes, one cannot well avoid the conclusion that many of its syllablings might with equal accuracy have been referred to quite different species from those indicated. "Chirr," for instance, Mr. Hett ascribes to the Bearded Titmouse, not, as some ornithologists would, to the Grasshopper-Warbler. "Chough chough" is his not unnatural rendering of the cry of *Pyrrhocorax graculus*, but the Jackdaw's well-known note can be similarly syllabled. "Phillip" we find referred to one species only—the House Sparrow; but the Lapwing owes its common Irish name, "Phillipeen," to its note in the nesting season being thus translated by our countrymen. "See" might certainly be ascribed to other birds besides the "Grey Wagtail, at nest." The Blackbird, for instance, in early summer, utters such a note, for which we cannot discover that Mr. Hett has given us any reading. If the Sedge-Warbler says "tut-tut," so, to some ears, does the female Cuckoo; and the Tawny Owl is far from the only bird whose note has been heard as "tu-whit tu-whoo." Irish naturalists have not forgotten a report of the last-named species having been heard at Howth, on the strength of a "tu-whit tu-whoo," which further investigation traced to

the Manx Shearwater; but as Mr. Hett syllables the Shearwater's cry under k, as "kittycooroo," there is little likelihood of the deceptive similarity being perceived by his readers. The left-hand pages of the handy little book are left blank for observations, and the space thus thoughtfully allowed is not a whit too ample. On the whole, our author's "Dictionary" cannot be pronounced complete; but it will nevertheless be useful, and might certainly form an entertaining pocket companion to rambles in the haunts of birds.

C. B. M.

PLANTS FOUND AT KILLOUGH, CO. DOWN.

BY J. H. DAVIES.

NEAR the end of last July, in the course of a few hours pleasant ramble in the neighbourhood of Ardglass and Killough, a part of the County Down coast which I had never before visited, it was my good fortune to meet with *Eleocharis uniglumis*. This, as also two or three other species which were then observed may, to Irish botanists, be of interest enough to warrant me in giving some of my notes thereon:—

Papaver hybridum, Linn.—Several plants on the border of a potato field between the road and the railway near Killough, where it is associated with *P. dubium*. Although this cannot be far distant from the place, "Roadside half-way between Killough and Ardglass," where it was discovered in 1892 by Mr. Praeger (*Supp. Fl. N. E. I.*), yet in the case of so rare a Poppy it may be worth mentioning that it is still there. When *Flora N. E. Ireland* was published in 1888, it was known to occur in District XII. only in two localities, not far apart, on the County Down side of Belfast Lough; and is absent from both the Counties of Antrim and Derry.

Thrincla hirta, DC.—On a wall at the bend of the road from Ardglass to Killough, and in several places along the same road, being most plentiful at that part where it crosses the railway. It still remains to be one of the rarest plants of the north-eastern district.

Eleocharis uniglumis, Linn.—In some abundance in a salt marsh near Killough, where it grows in company with *Blysmus rufus*, *Carex disticha*, and *C. extensa*. In point of rarity this Spike-rush is, perhaps, the best plant noticed in my short ramble. Indeed, it has been placed on record for only one station in District XII.—"Very sparingly" near Bangor, Co. Down (S. A. Stewart, 1867). In this place Mr. Stewart tells me that he has not since been able to refind it. But it is a plant that may be expected to occur elsewhere in suitable situations.

Hypnum (Amblystegium) serpens var. **depauperatum**, Boulay.—On rocks just above high-water mark at Ardglass Bay. It is a variety so well marked as to have been accorded specific rank by a continental bryologist (M. du Buysson), and differs from the type in that it is singularly rufescent, with very slender branches, the leaves being more distant and more minute, and the nerve less obvious. It has much the appearance of *H. confervoides*, for which, without close examination, it might be mistaken. It was first found in Ireland at Malahide, by the late Dr. Carrington, who designated it var. *salinum*, a name which is suggestive of its habitat. The only other Irish station for the plant is Portstewart, Co. Derry, where it was detected by Mr. S. A. Stewart in 1884.¹

The vicinity of Ardglass and Killough is particularly interesting alike to the naturalist and archæologist, and it was a cause of regret to me that my time there was so short. Several plants that are local in the north are there in great abundance. For example, *Linaria vulgaris*, which is by no means common in the district, is plentiful in many places, as is likewise *Silene inflata*, and *Scabiosa arvensis*, not often seen near the inland borders of the county, is in such remarkable profusion as to form quite a striking feature of the fields and waysides; and is conspicuous on the railway banks all the way from Crossgar by Downpatrick to Ardglass. *Arenaria leptoclados* occurs near the sea; and by Killough Bay, *Be'ta maritima* grows so rank that, in many cases, its stems become broadly fasciated with curiously multifid terminations. In the corn-fields there is much *Euphorbia exigua*, which, as a plant of the district, is rather rare. The expanse of *Sagina nodosa*, then in full blow, on a wet gravelly part of the coast on the Ardtole side of Ardglass Bay was delightful to behold; close by being great quantity of *Juncus maritimus*. *Ballota nigra* (*fætida*) is plentiful on banks and loosely-built walls, especially so on Coney Island, but in no case far removed from the neighbourhood of cottages, and may be the result of former garden cultivation. In remote times it was, I believe, grown in some places for use as a medicine for cattle, but its supposed virtues have long ceased to be recognised, and I am not aware that it is anywhere now cultivated. It certainly could not be discovered in any of the cottage gardens which I had the curiosity to examine.

Lisburn.

¹Dr. Braithwaite's *British Moss-Flora*, vol. III. p. 25.

PROCEEDINGS OF IRISH SOCIETIES.

ROYAL ZOOLOGICAL SOCIETY.

Recent gifts include a pair of American Black Bears, from the Countess of Caledon, eight Jerboas from Dr. C. B. Ball, a parrakeet from Mr. Jas. Doyle, a monkey from Major G. H. Johnstone, a Japanese Mouse from Mr. H. A. Davis, a pair of Kestrels, a Chough, a Puffin, a Guillemot, and a Herring-Gull from Sergt. J. McGoldrick, a Golden Plover from Mr. S. H. Curren, a Dotterel from Mrs. Ireland, a Jackdaw from Mr. J. Horan, seven crocodiles, a monitor, and a tortoise from Dr. E. G. Fenton, and a lizard from Mr. J. N. Mostyn. A pair of Spoonbills, a pair of Purple Herons, a pair of Bitterns, two Ourang-outangs, ten Japanese Paradise Fish, and five Chameleon Fish have been bought. Three Golden Agoutis and three Puma cubs have been born in the Gardens.

19,300 persons visited the Gardens during July, and 17,232 during August.

DUBLIN MICROSCOPICAL CLUB.

JUNE 16.—Mr. GREENWOOD PIM exhibited *Odontia barbaeovis*, a curious little fungus belonging to the *Hydnum* section. It is found encrusting fallen branches, and with a hand-lens a kind of papillose hymenium is visible, the peculiar feature of this genus being the fringed tips of the papillæ. The specimens occurred in a collection made by Prof. Johnson at Cappagh, but the plant is easily overlooked as being an imperfect *Polyporus*, and is probably not uncommon.

Mr. HENRY J. SEYMOUR showed a thin section of the Arran pitchstone, showing the feathery aggregates of hornblende microlites arranged in fern-like fronds. He also exhibited two photo-micrographs taken by him of this rock.

Mr. HENRY H. DIXON showed specimens of *Cuscuta reflexa* parasitic on its own branches. It has been said that *Cuscuta* never sends haustoria into its own tissues, but the sections exhibited showed well developed cellular haustoria arising from one branch and thrust into the medulla of another. The haustoria, so far as has been at present observed, do not possess the same differentiation of tissues as when penetrating another plant. Thus the lignified tracheidal connection between the wood of the host and parasite, which is usually developed, was not found when the parasite preyed upon its own branches.

The same member showed sections of the thallus of *Conocephalus conicus*. The rhizoids and lower cellular layers of the specimens of this liverwort were invaded by a parasitic or symbiotic fungus. The hyphæ of the fungus often present an appearance somewhat similar to the internal rhizoids of *Lunularia cruciata*, from which, however, they may be distinguished by being in connection with well-developed sporangia, which may be external to the thallus or imbedded in its tissue. The branching of the hyphæ and their uniformly smooth walls also form distinctions from the structures referred as well as their multinucleate condition.

BELFAST NATURALISTS' FIELD CLUB.

JULY 30.—BARNEY'S POINT.—The first field meeting of the Belfast Naturalists' Field Club was held here more than 35 years ago. Until then Barney's Point was scarcely known; since then it has been frequently visited and always with interest. On July 30 the Field Club's fifth excursion for the year was to Barney's Point. They went by Magheramorne, and crossing the lough by the ferry reached Mill Bay, from which Barney's Point is but a short walk. As it was low water when the party arrived, the well-known outcrop of the Lias was very fully exposed. A short field lecture was given by Mr. W. Gray, M.R.I.A., explaining the age and nature of rocks that crop out here, and dealing with their relations to other formations. Standing at Barney's Point, and looking over the lough to Magheramorne, an excellent section can be seen of our northern rocks, forming the face of the limestone quarry at Magheramorne. Below the cultivated soil of the surface there is a considerable deposit of Boulder Clay. Below this we have the dark basaltic rocks. Below this there is the white limestone or Chalk and the Greensand. Going back in time, descending in the formations, a great break in the geological record is reached. These absent beds comprise a series of rocks several thousand feet thick. We are only left the representative of the lower Liassic beds, and they rest upon the New Red Sandstone series. The lower Lias in this locality yields abundant fossil remains, which are often easy to separate out from the rock, in fine preservation. Good lists of these fossils have been published in the B.N.F.C.'s *Systematic Lists*. Many good type specimens were found on this occasion, and recently one member collected two vertebræ of some extinct saurian.

AUGUST 20.—EXCURSION TO KILLOUGH.—The sixth field meeting was held at Killoogh, and the district was explored in search of such objects of interest as usually engage the attention of the members. A party of twenty turned out. A detachment plunged into the White Bog, while the main body took the direct road for St. John's Point. A halt was made at a wayside holy well, which is said to be dedicated to St. John. Passing on to the old church of St. John, another holy well was visited, once held in high esteem, but is now in a most disgraceful condition. The well is dry, and neglected save only by some roughs who have blocked the well with a large stone, once known as the Wishing Stone. Standing around it the Field Club passed the following resolution:—"We deeply regret to find the Wishing Stone at St. John's Well removed from its old position and thrown into the well. Such mischievous and improper conduct merits the strongest public condemnation. Every effort should now be made to remove the stone and restore it to its former position. This undertaking will have the warmest sympathy of the Club." Leaving the Holy Well, the ruins of St. John's church were next explored. This is one of the most interesting examples of ancient church architecture in the North of Ireland.

Not far from the church we come to St John's Point and its lighthouse. There is a well-marked difference between the surface geology of the bay south of St. John's Point and the surface geology of the shore to the north, from St. John's Point to Killough. The Bay of Dundrum has for the most part a flat sandy shore, backed by extensive sand-dunes, which extend for a distance of six miles around the shore, and at low water great stretches of flat sandy surface are exposed, whereas from St. John's Point to Killough the shore is composed of the serrated edges of tilted rocks in the wildest confusion, and of the grandest aspect. Here are thin layers of fine shale laid down in deep still water; here are the rougher grits of ancient shore-lines, and their upturned edges are now cut through in all directions by varied forms of once molten volcanic matter, that now stand out as dykes throughout the district. A rich variety of rock specimens was secured here, and the marine workers made good use of the favourable opportunity afforded them in the rents, fissures, and rock-pools that abound along this sea-beaten coast. Four species of Isopods were seen, the specimens of *Ligia oceanica* being exceptionally large.

Of land and fresh-water shells, some thirty species were collected, the best of these along the drains and flax-pools in the White Bog—an alluvial flat—where some of the sub-fossil shells were also found. Of recent species, *Hyalinia nitida*, *Amalia gagates*; a thin var. of *Helix nemoralis*, fairly common in one hedgerow; *Vertigo antivertigo*, *V. pygmea*, *Aplexa hypnorum* and *Planorbis spirorbis*, are worthy of record, the latter being mainly the var. *ecarinata*.

Coming near to Killough, the raised beach and the upper accumulation of coarse gravel, which Harris, writing 150 years ago, called "unripe sandstone," was noticed. This deposit, cemented by calcareous matter, occurs along the shore from Killough by Ardglass, to some distance northward.

Killough, presenting such a variety of physical conditions, is known as an interesting one for the botanist, yielding a number of plants of rarity. On the coast the following were collected;—*Scutellaria galericulata*, *Sagina nodosa*, *Senebiera didyma*, and white Centaury. On the roadside near the well, the Dwarf Elder, or Dane's-blood, was found; also one of the rarest local rushes, *Juncus obtusiflorus*. *Beta maritima* occurs near Killough station. *Cichorium Intybus* was found in a grazing field near the town. The principal discovery of the day was the Samphire, *Crithmum maritimum*. The sample was collected near St. John's Point, where it is hoped it will be preserved, and not exterminated.

SEPTEMBER 10.—EXCURSION TO HOLLYMOUNT, near Downpatrick.—A bright day brought together a goodly number of members. Arriving in Downpatrick, the party was joined by other members, and the greater portion started in waggonettes for Hollymount grounds, while another section of archæological taste set off in the opposite direction. A drive of two miles brought the party to the entrance of the demesne, and a narrow lane led to the marshes, which fringe the estate. There

some of the botanists and conchologists plunged out in search of treasures, whilst the majority preferred to skirt along the edge of the wood. Retracing their steps, the stragglers were picked up, and the united party entered the woods, and wound their way round in a circle.

Hollymount House was again reached after an absence of a few hours, and the members walked down the drive to inspect Ballydugan Lake—a small piece of water which lies nearly opposite to the entrance of the demesne. A few fresh-water shells were collected at the lake margin, but little else was observed.

A discussion on the results of the day showed that the finds had not been so interesting as had been expected. The botanists had noted the Water Violet (*Hottonia palustris*) in the drains at Hollymount; the Small Knot-weed (*Polygonum minus*) and the Least Marsh-wort (*Apium inundatum*) in the marshes; whilst in the woods the Guelder-rose, (*Viburnum Opulus*) in berry formed a pretty sight. The coleopterists were disappointed in the small number of forms noted, none of the longicornia being met with. A fair number of land-shells were obtained in the marshes and in Ballydugan Lake. Among other common species were *Limnæa palustris*, a small thin form; *Physa fontinalis*, *Planorbis marginatus*, *P. albus*, *P. contortus*, *Ancylus lacustris*, a sub-scleriform variety of *Valvata piscinalis*, probably var. *antiqua*, Sow., mostly dead specimens; *Sphærium lacustre*, one full grown specimen, this latter is a new record for the North of Ireland (it was also found in quantity the same day by two members of the Belfast and Dublin Clubs who were dredging in Lough Neagh, near Antrim). In Dr. Scharff's list (*Irish Naturalist*, 1892), it is only noted from four districts in the south and east, where he states it is decidedly rare. A prize had been offered at the beginning of the day for the largest collection of botanical specimens. The President (Rev. C. H. Waddell, B.D.), acted as judge, and it was announced that Miss Finlay was the winner with 87 specimens.

The minor party visited Ballee old church, Bright, and Ballynoe, and rejoined their fellow-members at Downpatrick, where tea awaited them. There was still some little time left, and visits were made by some to the great rath, on the north side of the city. The old cathedral was also visited. Lastly, the high cross of Downpatrick received a share of attention, and perhaps with some degree of justifiable gratification by the members of the Field Club who had assisted in its restoration.

DUBLIN NATURALISTS' FIELD CLUB.

AUGUST 13.—EXCURSION TO ENNISCORTHY.—A very small party travelled to Enniscorthy by the morning train, where they were joined by a good contingent from Ferns, and by Capt. Perceval from Wexford. Vinegar Hill was visited, and *Spergularia rubra* noted growing among the rocks on its summit. A marsh lying to the southward was next explored, and then the banks of the Slaney. An interesting crop of aliens were found growing luxuriantly on rubbish heaps of the river, including *Solanum nigrum*, *Matricaria Chamomilla*, *Cannabis sativa*, *Lapidium rudérale*, &c.

RECENT FIELD CLUB PUBLICATIONS.

Part II. of the *Journal of the Limerick Field Club* is to hand. The only natural history contribution—and the first that has appeared in this publication—is a paper on “The Flora of the Limerick District,” compiled by Dr. W. A. Fogerty, and representing the work of several botanical members. It is to be noted that Dr. Fogerty is not responsible for the determination of the plants which he records. We cannot refrain from expressing the opinion that it might have been advantageous to have had the authority of some botanists of recognised standing—say the editors of the new *Cybele*—when making the startling announcements which we find in this paper. It rather takes one’s breath away to find among the plants of the Limerick district *Stellaria nemorum*, *Trinia glaberrima*,¹ *Peucedanum officinale*, *Carum segetum*, *Hypochaeris glabra*, *Sonchus palustris*, *Veronica triphyllus*, *Damasonium stellatum*, and *Luzula arcuata*, not one of which is included in the Irish flora. And this shock somehow spoils our pleasure in noting the discovery near Limerick of such rare or critical Irish plants as *Fumaria densiflora*, *Vicia Orobus*, *Epilobium roseum*, *Arcium majus*, and *Melampyrum sylvaticum*. Then the reading of the paper is made painful by the extraordinary misspellings with which it is crowded. “*Menyanthis trifoliati*” and “*Epipactus violaciæ*” are bad enough, but they are surpassed by “*Vailantii*” (= *Vaillantii*) and “*Sparangium*” (= *Sparganium*). Only one word more before we leave this subject. The paper closes with a list in which “eighty species are recorded as additions to the flora of the district” (i.e., District VI. of *Cybele Hibernica*). But if from these eighty species we eliminate a large number of the merest casuals, and others which we are sadly afraid are mistakes, we have a comparatively small list of plants, the majority of which have been already recorded from the district in various papers—some by Corry in his “Notes of a botanical ramble in the County of Clare,”¹ many others by Stewart in his “Report on the botany of South Clare and the Shannon,”² others again in Mr. Colgan’s recent paper “On the flora of the shores of Lough Derg”³; and others elsewhere. In conclusion, we cannot but feel regret that still another should be added to the appalling number of publications through which the present-day naturalist must drudge if he wishes to make sure that he is overlooking no record in any group at which he may be working. There can be no objection to one of our Field Clubs publishing a *Journal* for matters of purely local interest, but a paper which gives—or purports to give—numerous additions to the flora of Ireland and of District VI. cannot be so described. We have already in Ireland half a dozen channels through which such information may pass to the public; surely this number ought to suffice for the publication of matters relating to Irish natural history.

¹ *Proc. Belfast Nat. Hist. and Phil. Soc.*, 1879-80.

² *Proc. R.I.A.*, 3rd s., vol. i., no. 31, 1890.

³ *I.N.*, vi., pp. 189-197, 1897.

The *Proceedings* of the Belfast Naturalists' Field Club have been published now for a continuous period of thirty-five years, which gives them a fixed and recognised position in the scientific literature of the country, and renders the above remarks inapplicable to them. The part for 1897-98, which lies before us, contains no features which call for special comment. Concise accounts of the excursions of the year are followed by brief abstracts of the papers read, and short reports from the botanical and geological sections. The only paper printed in full is a brief one by the present writer, summarizing the botanical discoveries made in District XII. between the date of issue of the *Supplement to the Flora of N.E. Ireland* and the end of last year.

R. L.L. P.

NOTES.

We are authorised to announce that the new edition of *Cybele Hibernica* will appear early in October. Subscriptions will be received by the publishers (Messrs. PONSONBY, Grafton-street, Dublin) up to 8th inst., after which date the price will be raised from 10/6 to 12/6.

Our congratulations to our contributor H. Lyster Jameson, B.A., on whom the degree of Ph.D. has just been conferred at Heidelberg.

Dr. Scharff and Mr. Welch have made a preliminary dredging trip to Lough Neagh, and we understand they have secured interesting results. A careful study of the Lough Neagh fauna is one of the most important pieces of work awaiting the Irish zoologist.

Mr. Lionel E. Adams, who was unable to attend the Kenmare conference, has visited that locality since the cessation of the hot dry weather that marked the visit of the Field Clubs. As a result, he secured the much coveted Kerry Slug, and also the very rare shell *Limnaea involuta*.

The results of a preliminary zoological exploration of MacGillycuddy's Reeks, carried out last month by Dr. Scharff and Mr. Carpenter, will appear in our pages. Some valuable captures were made.

The second long excursion of the British Mycological Society, which is being held in Dublin as we go to press, is turning out successfully and pleasantly. A report of the proceedings will appear in our next issue.

Ireland was represented at the recent International Zoological Congress at Cambridge by Mr. W. F. de V. Kane, Dr. Scharff, Mr. R. M. Barrington, Mr. Barrett-Hamilton, Judge Kane, and Mr. Carpenter.

Advices from Prof. Haddon, written from Port Moresby, New Guinea, in June, report the continued success of his expedition, and good health of the members of the party.

BOTANY.

PHANEROGAMS.

Brachypodium pinnatum, Beauv., an addition to the Irish flora.

On August 7th last I found this handsome grass covering a large extent of surface on the sandhills at Tramore, county Waterford, where it is, in my opinion, undoubtedly native, the plants growing with it being *Rubus cæsius*, *Amphiphila arundinacea*, *Cynoglossum officinale*, *Viola Curtisii*, *Rosa spinosissima*, &c., and no cultivation or houses, except one small cottage a mile distant, within three miles of it. Mr. Arthur Bennett, F.L.S., has kindly verified the identity of my specimens. This species was recorded for county Cork many years ago, but it has not since been found there, and all subsequent writers have agreed that some other plant must have been mistaken for it, I therefore have much pleasure in now adding it with certainty to our list of indigenous Irish plants.

Cork.

R. A. PHILLIPS.

Arenaria tenuifolia, Linn., in Ireland.

While waiting for a train at Ballybrophy railway station, Queen's County, on June 14 last, I strolled along the line, and noticed quantities of an unfamiliar-looking plant which subsequently proved to be the above species, for which I can find no previous Irish record. A few weeks later (July 21) I was surprised to find a good deal of the same plant on the railway near Bansha, county Tipperary. The plants accompanying it in each case were *Linaria viscida*, *Cerastium triviale*, *Sagina procumbens*, *Senecio vulgaris*, &c. Owing to its growing so freely in both these localities I look forward to hearing of its discovery in many directions along our Irish railways. Mr. Arthur Bennett, F.L.S., and Mr. N. Colgan, M.R.I.A., have kindly identified my specimens.

Cork.

R. A. PHILLIPS.

To Mr. Phillips's note I may add that during the last two seasons I have been turning up *Arenaria tenuifolia* in several parts of Ireland. It was first found in the large gravel-pit by the railway at the Curragh of Kildare in June, 1897, where it grew abundantly and luxuriantly, in company as usual with plants of doubtful standing—*Alyssum calycinum*, *Linaria viscida*, *Calamintha Acinos*, *Orobancha minor*, *Senebiera Coronopus*. Since then I have found it in four other places:—County Roscommon, on the railway a few miles N.W. of Athlone; county Carlow, railway at Milford; King's County, railway at Banagher; North Tipperary, at the terminus of the derelict railway at Portumna. In every case the plant grew on railway ballast, accompanied by *Linaria viscida*; and in all but the Carlow station, *Cerastium tetrandrum* was also present. It is a remarkably inconspicuous plant, though not very small, and presumably this accounts for its very late addition to the Irish flora. Probably it has been spreading in recent years, like its companion, *L. viscida*.

Dublin:

R. LLOYD PRAEGER.

ZOOLOGY.

INSECTS.

Sirex gigas in Ulster.

I received on the 10th September a very fine specimen of this large Saw-fly which had been caught at Florida, Co. Down. I have also received a specimen from Ormeau Park; and another from near Ballymena. "Very common the last three or four years at the last place, but not seen there previously"—so the farmer said who brought it.

City Museum, Belfast.

CHAS. ELCOCK.

Nyssia zonaria in Co. Antrim.

Referring to Mr. Kane's interesting remarks regarding this species (pp. 135-6 of this volume), it was Mr. Milne, not I, who first found the larvæ at Ballycastle, in June, 1893.

Londonderry.

D. C. CAMPBELL.

A Plague of Ants.

On Sunday, August 14, on approaching Blessington from the east, immense numbers of winged ants were observed, flying, or crawling on the grass and roads. They became more abundant on nearing the village, and I roughly estimated that on the half-mile of road adjoining the village over a million and a half of ants were crawling, while in the air above the road they were so abundant that my clothes were quite brown with them. The fields on each side were thick with them, the windows of the hotel were alive with them, and my tea was richly flavoured with them. Unless they were confined to a narrow line down which I had the fortune (?) to walk, there must have been hundreds of millions of them within a mile of Blessington. Whence came such a vast host of ants? Can our Hymenopterists explain? The ants were all of the one species—a common small brown ant.

Dublin.

R. LLOYD PRAEGER.

All the species of ants occurring in this country, when the weather is favourable, swarm in August. From the description these insects may have been the common Bank Ant, *Lasius flavus*, De G., or some of the commonly distributed races of the Red Ant, *Myrmica rubra*, L., most probably the latter. I met with immense swarms of both these species about the middle of last month on the shores of the Lower Shannon, and also about Tralee. 1895 was the last year in which I noticed the same abundance.

Blackrock, Co. Dublin

H. G. CUTHBERT.

BIRDS.

Tame Gulls.

It may, perhaps, be of interest to the readers of the *Irish Naturalist*, if I give an account of some tame gulls which have been or are in my possession. About nine years ago I got a pair of young Herring Gulls sent to me from Rathlin Island. I had them for five years when one of them was killed by a horse, and the other disappeared shortly afterwards. We kept one of their wings cut, and they lived on the lawn and pleasure-ground around the Rectory, coming to be fed either to the hall-door or dining-room window.

When three years old their plumage was almost perfect, and during the breeding season they were very noisy, croaking and rolling themselves in the grass as if making a nest. Being only an amateur I was at a loss to know what sex they were of, and applied to a person of very high attainments in the ornithological world for the distinctive marks by which the male may be known from the female. I am sorry to say the information I received was so vague and indefinite that I was doomed for the present to remain in ignorance. However, I determined to solve the mystery for myself, and so two years ago last June, while travelling in Co. Donegal, I found myself on Bunglas Point, and there made the acquaintance of a local fisherman, who promised to send me a few young Herring Gulls (I pointed out to him the kind I wanted). The result was he sent me half-a-dozen youngsters in a box by rail, which arrived safely. Four of these I have still, and have watched them develop ever since with very keen interest, and have mastered the difficulty of distinguishing the sexes. I know now that the first pair I had were both males. Of these four there is one male and three females. The male is much larger than the female. He walks with his head erect, and his neck extended. The crown of his head is large and flat, and he has a noble air about him, which is lacking in the females. Although only two years old, his plumage is nearly mature. During the spring of this year his bill cast off its sombre brown colour, and has now all the tints of the fully developed bird. The females on the other hand still wear their mottled dress, and their bills are still brown. I am anxious to see if they will hatch next year. The male has already made a selection among the young ladies, and seems to be "engaged" to one of them. This attachment began in May last. It is very amusing to watch this pair of youthful lovers, bowing and "spakin'" to each other. These attentions from the male have given rise to jealousy in the heart of his fair spouse towards her less fortunate sisters, whom she persecutes in a most shameless manner, and even at times induces her *fiancé* to join in the persecution. Of course their love-making was more demonstrative during the months of May and June. I hope at a future date to record further developments in these lovers' career.

Tanderagee.

WM. M'ENDOO.

Woodlark in Co. Wicklow.

On 3rd September, while shooting near Bray, Co. Wicklow, I observed a small flock of these birds feeding in a grassy lane; they were very tame, allowing me to approach quite close, when they would rise suddenly, and fly a short distance, making almost a characteristic swoop, and uttering a note fairly indicated by the French name "Lu-lu" repeated several times (Saunders). For the purposes of identification I secured a specimen which proved to be an adult female.

Trinity College, Dublin.

E. BLAKE KNOX.

Knot (*Tringa canutus*) at Portsalon, Lough Swilly.

On 17th August a pair of Knots in *full breeding plumage* were seen on the sands at Portsalon. Mr. H. Williams, of Londonderry, obtained one, which I examined.

Londonderry.

D. C. CAMPBELL.

MAMMALS.**Daubenton's Bat (*Vespertilio Daubentonii*, Leisler) in Co. Wicklow.**

A female of this rather uncommon species was shot by Mr. E. B. Knox, at Bray, county Wicklow, on the evening of September 8. It formed one of a little party of six or seven, which flew up and down a stream very close to the water, and we had observed them for several evenings before we were able to secure a specimen.

Daubenton's Bat has seldom been recorded from Ireland (see H. L. Jameson, *Irish Nat.*, vi., Feb., 1897), and never from Wicklow, the nearest locality being Tankardstown Bridge, county Kildare (J. R. Kinahan, *Proc. N. H. Soc. Dubl.*, ii., pp. 154-170). It is gregarious in its habits, and consequently when observed at all it is usually seen in considerable numbers. It is rather larger than the Pipistrelle, and the fur is much darker in colour on the neck, a light grey below, rendering this bat more easily seen against a dark background. An interesting account of its habits is to be found in Bell's "British Quadrupeds," 2nd ed., pp. 60-66, and in the "Zoologist" (Mr. J. E. Harting) (3), xiii., 1889, pp. 161-166, which also gives a coloured plate.

Mr. Knox also furnished me with specimens of the Hairy-armed Bat (*Vesperugo Leisleri* Kuhl) and the Pipistrelle (*Vesperugo pipistrellus*, Schreber) from the same locality, and also from Greystones (recorded previously from Wicklow by Kinahan, *loc. cit.*, and Barrington).

These three species were all seen together on the wing at Bray, and afforded an interesting contrast. The Hairy-armed Bat came out first, about 6.45 p.m., and flew over a wide area, at a considerable height, often screaming loudly in its course. The Pipistrelle appeared next, at 7 o'clock, with a more devious and fluttering flight; it was apparently nearly silent. Daubenton's Bat was the latest, at a quarter past seven and flew very close to the water; it made no noise at all.

Trinity College, Dublin.

N. H. ALCOCK.

RECENT ADDITIONS TO THE LIST OF IRISH
FISHES.

BY ERNEST W. L. HOLT.

SALMONIDÆ.

Argentina silus, Ascan. The Great Silver Smelt.

A fine specimen, $16\frac{1}{2}$ inches in length, was landed at Plymouth on the 15th June, 1898. It had been trawled, in company with others, at a depth of 74 fathoms, 75 miles true S. of the Old Head of Kinsale. Some of the fish were eaten by the crew of the trawler, and pronounced of excellent quality.

Hitherto *A. silus* has only been known as an inhabitant of rather deep water, 100 fathoms and less, on the northern coast of Europe, from Norway to Jutland, and from the Atlantic coast of N. America. The specimen recorded from the Scottish coast under this name by Edward subsequently proved to belong to the smaller species, *A. sphyræna*, Linn., which may be called the Small Silver Smelt. The latter was found, during the Royal Dublin Society's survey on the west coast, to be by no means rare in deep water. It is impossible to decide whether the occurrence of *A. silus* in our seas should be considered normal or exceptional, since the weather interfered with subsequent trawling operations in the same locality and no earlier evidence, positive or negative, is available. Our scanty records of its occurrence, and the nature of the food which I found in the stomach of the specimen which forms the subject of the present note (see *Journ. M. B. Assoc.*, n.s., vol. v., 1898), would appear to indicate that it haunts the lower strata of the water in its adult condition, and is therefore unlikely to be directly dependent on the influence of surface currents. It is, however, quite possible that the larvæ are pelagic and occur even at the surface, as has been shown by Collett to be the case with the Norway "Haddock," *Sebastes norvegicus*, a form which agrees with *A. silus* in its adult distribution. Day ("Fishes of Gt. Brit.," vol. ii.), describes and figures *A. sphyræna* and briefly indicates the distinguishing

characters of *A. silus*. Excellent figures of both species are given by Smitt in Hist. Scand. Fish., ed. 2, ii., pp. 913, 915. The Argentine of Pennant ("Brit. Zool.," vol. iii., p. 432), and Thompson ("Nat. Hist. Ireland," vol. iv., p. 175), is really a Scopeloid, *Maurolicus Pennantii*, Walb.

SYNGNATHIDÆ.

Syngnathus rostellatus, Nilss. The Lesser Pipe-fish.

Until quite recently it has been generally considered that only one species of *Syngnathus* existed in British waters, although it was well known that certain individuals became sexually mature at a very small size, and were characterised by an unusually small number of bony rings (cf. Günther, "Catalogue," vol. viii., p. 159). It has now been shown by Smitt (*op. cit.*, p. 672), and by Duncker (*Journ. M. B. Assoc.*, n.s., vol. v., 1898, p. 175), that the differences are sufficiently constant to entitle the two forms to specific separation. *S. acus*, the larger species, has a total number of 62 to 66 bony rings, of which 19 to 22 belong to the body. In *S. rostellatus* the total is 52 to 56, 13 to 17 belonging to the body. This distinction is available from the stage at which the individual leaves the brood-pouch of the male parent, and the snout is always relatively shorter in *S. rostellatus*.

The prevailing confusion must be held responsible for the absence of *S. rostellatus* from Irish records, since the species is probably common enough, as in England. In the national collection at Dublin I find a specimen from Portrush, presented by Mr. Ogilby, as well as several taken by myself on the west coast during the Royal Dublin Society's survey. At present the latter bear no detailed label of locality.

Leinster House, Dublin.

ELATINE HYDROPIPER, LINN., IN THE
LAGAN CANAL.

BY J. H. DAVIES.

AFTER frequent searchings, during several years, it has now been my good fortune to meet with *Elatine Hydropiper* in great abundance in the Lagan Canal, a few paces above the tenth lock, at Tullynacross (about a mile from Lisburn), Co. Down, 23rd September, 1898.

The bottom of the canal at the place where it occurs is firm and gravelly, and is entirely free from mud. The clearness of the water at this particular spot is such that, on a bright day, the plant may readily be discerned from the towing-path, and the more so since there is not much aquatic vegetation beyond a little of the alien *Elodea canadensis*, a plant which, although still occurring in greater or lesser quantity throughout the whole length of the canal, seems year by year to be diminishing. The brilliant September sunshine which revealed *E. Hydropiper* to my admiration, enabled me to see, perhaps, the extent of the space over which it had spread, an area of several square yards being closely covered by the plant. There were, besides, very numerous scattered tufts for some yards farther along. The plants were remarkably luxuriant, much larger than any herbarium specimens that I had seen, the average stems being three to four inches in length. The examples from other localities are mostly one to two inches, and some even smaller. Seen under the microscope, the curiously curved and sub-coiled seeds, alike as to their form, their colour, which is of very delicately graduated shades of translucent green, and their groups of pitted markings, are objects of singular beauty.

In the two localities where the species had previously been found in the Lagan Canal—at Annaghdroghal, near Lough jNeagh (Dr. Moore, 1837), and at Belfast (Dr. Mateer, 1847)—it is supposed to be lost. Indeed, not having been refound

at Thompson's original station in Newry Canal (1836), it was suspected that, as an Irish plant, it had become extinct, until in 1890 it was discovered in Loughbrickland, Co. Down, by Rev. H. W. Lett (*Supp. Fl. N. E. Ireland*).

From Annaghdroghal, the locality now recorded is distant, by the course of the canal, about seventeen miles, and from Belfast about ten miles. In both those places the plant has been diligently sought by several painstaking observers, at various times, during the last half century, but in vain. At Belfast, the water of the canal is now for the most part so foul that a plant so delicate, flourishing as it does in clear water, could hardly be expected to grow there. The former station at the other extremity of the canal was visited by me only a few weeks ago, and on that occasion the courteous manager obligingly placed a man and a boat at my service. The water there was so turbid, and so dense was the growth of water plants, chiefly pond-weeds—(*Potamogeton natans*, *P. perfoliatus*, *P. pusillus*, and *P. pectinatus*, being the predominant species) *Nuphar* and *Elodea*, that the bottom was nowhere visible. The thick, black, slimy ooze of the bed of the canal—"glaur" in the local vernacular—the accumulated result of the perennial decomposition of the abounding vegetation was such as to cause me to form the assured belief that the plant no longer exists there. Nevertheless, some hours were spent unsuccessfully in dredging and raking both from the boat and the bank. There is more likelihood of the species being in Lough Neagh, but along that part of the shore which was examined, a distance of some two or three miles, it could not be found. Probably, however, it will yet be rediscovered in that place.

Lisburn.

SUPPLEMENTARY NOTES ON THE MOLLUSCA OF
SOUTH-WEST IRELAND.

BY A. G. STUBBS and LIONEL E. ADAMS, B.A.

THE following brief notes on the Mollusca of S. W. Ireland, contributed by request, embody the result of a week's excursion to that most interesting locality during the early part of September, and are intended to supplement Mr. Standen's Report on the Mollusca of the Kenmare Excursion, published in this Journal (p. 218). We do not take up valuable space by mere recapitulation, but where our experiences differ from those who worked the district in July comment will be made. Had the weather been similar to that experienced in July in all probability these notes would not have been written, but owing to two days' heavy rain a little further information is forthcoming. We use the classification adopted by Dr. Scharff for the sake of convenient reference to the Report.

Hyalinia Draparnaudi, Beck.—Though not within the district worked in July, it may be interesting to record that a single dead shell, 14 mm. in diameter, was found at Blarney Castle. This shell is precisely similar in form and texture to the recognised *Draparnaudi* from Tenby and Exeter, but without the animal it is difficult to be positive, especially as both *cellaria* and the "doubtful form" were present.

Hy. cellaria, Müller.—Though rain had fallen, this species was not at all common at Kenmare nor very large, but at Killarney and Aghadoe some extremely fine specimens occurred. At Bantry they were also very fine.

Hy. radiatula, Alder.—The type throughout the district bears a very small numerical proportion to the variety. This is the case also in Antrim.

Hy. pura, Alder.—Only a few dead shells were noted from Torc Woods.

Arlon intermedius, Normand (= *A. minimus*, Simroth).—This species, found plentifully, is much darker and more strongly banded than is the case in Britain.

Geomalacus maculosus, Allman.—Specimens from Glengarriff are nearly black in ground-colour and the spots small and white, whereas those from Kenmare have a greenish ground-colour, with yellow spots, and bigger than those from Glengarriff. In all cases the spots are less numerous in the regions of the lateral and dorsal bands which exist in other slugs, and this is especially noticeable in young specimens. The creature has a habit of curling up into a perfect sphere when irritated, after the manner of a woodlouse.

Limax maximus, L.—Throughout the whole district we only came upon examples of the type, which in the North of Ireland is the exception.

L. marginatus, Muller. (= *L. arborum*, B. Ch.).—This slug is perhaps the commonest in the district, particularly round Killarney, where immense specimens of var. *maculata* occurred.

L. flavus, L.—This form, which does not seem to have been noticed in July, was found at Blarney and Killarney, though very sparingly.

Amalia Sowerbyi, Fér.—Found sparingly all over the district.

Amalia gagates, Drap.—One specimen of the type occurred between Bantry and Glengarriff, and two examples of var. *plumbea* were found under a stone in a field on the Cloonee road beyond Mucksna Wood.

Helix fusca, Mont.—On bracken fronds in a wood on the Cromaglaun Mountain. Several in Mucksna Wood on Bracken and on Flags. Near Aghadoe on Flags, but confined to a very small area, both the type and the pale form *vitrea* were taken abundantly.

H. intersecta, Poir. (= *H. caperata*, Mont.).—Fairly abundant along the Cloonee road, all typical except one of the form *ornata*. We also took it at Killarney on a wall.

Cochlicopa lubrica, Müller.—With some of the var. *hyalina* in Mucksna Wood a beautiful clear white specimen was found.

Pupa anglica, Fér.—At Kenmare the type is common in Mucksna Wood, in a wood behind the Southern Hotel, and in a plantation near the water in front of the Hotel. A few specimens of the var. *alba* were also taken in all three places. The var. *pallida* is plentiful in Mucksna Wood. At Killarney a flourishing colony mainly consisting of the albino form exists, whence we took 150 specimens. Here the var. *pallida* occurs also, and very occasionally a typical individual.

Balea perversa, L.—The rain brought this species out in great abundance all over bare beech trunks and other trees which were covered with moss. At Killarney we found two or three individuals on Flags with *S. putris*.

Clausilia bidentata, Strom.—A single albino was taken at Killarney; and the peculiar form described in Mr. Standen's Report occurred at Roughty Bridge.

[*Succinea elegans*, Risso.—We did not see a single individual of this species, though *S. putris* was exceedingly common and often very fine.]

Succinea oblonga, Drap.—Though we searched most diligently in the spot at Roughty Bridge which Mr. Collier kindly indicated, we only succeeded in finding a single specimen. This was of remarkable size, measuring $8\frac{3}{4}$ mm. in altitude and 5 mm. in breadth.

Limnæa involuta, Harvey.—Profiting by the experience of Messrs. Collier and Chaster, we engaged the same competent and intelligent guide and visited the Mecca of British conchologists. After a couple of hours' hard work we captured thirty-eight specimens, none

of which, however, were more than half grown, and many were quite babies. The smallest ($1\frac{1}{4}$ mm. in altitude) was especially interesting, as it showed the young shell to be of the same form as *peregra* and not intorted (see figure). When placed in a glass of water some crawled up the side out of water for about an inch, but soon descended. Their crawling movement is rapid, and the figure drawn by Mr. J. W. Taylor in Part I. of his "Monograph" admirably shows the attitude. Our independent estimate of the size of Lake Crincaum corresponded with that of Messrs. Collier and Chaster.



The shell apparently keeps on breeding for a long period, as we found masses of spawn in a very early stage attached to stones.

***Limnæa peregra*, Müller.**—Near Aghadoe in a small stream we took a good series of thin medium-sized shells with a tendency to scalariformity, among which we found after cleaning three of the rare var. *candida*, perfectly white.

***Aplexa hypnorum*, L.**—This is also a specific addition to Mr. Standen's list. It occurred with *Planorbis spirorbis* in a small trickling ditch near Aghadoe.

Northampton.

GEOLOGY FOR BEGINNERS.

Geology for Beginners. By W. W. WATTS, M.A., F.G.S. With 310 illustrations. London: Macmillan & Co., 1898. Price 2s. 6d.

The author of this excellent little work will not feel it as any disparagement when we say that its most original feature lies in the illustrations. For very many of these, notably those of microscopic sections, are his own work; while others have been gathered, with conspicuous judgment, from the geological series formed by friends throughout the British Isles. The clear little blocks of fossils are mostly from Zittel's latest manual on Palæontology.

We could have wished that more of the landscapes could have been produced on the scale of Mr. Achison's beautiful "Cwm glas," or Mr. Welch's brilliant "Overfold" on p. 107. But that would have made an expensive feature in a work that aims at carrying geology into schools; and we are thus left to hope that the teachers themselves will make collections of photographs on a larger scale, illustrating the phenomena so clearly outlined in the book. With its simple and lucid style, and its admirable typography, the work appeals at once to the young reader.

Prof. Watts assumes that his readers have no preliminary chemical knowledge—which is likely to be true in many cases. But, in view of the struggle that science still has to make in educational circles, is it not better to boldly presume some knowledge, and to sketch in the necessary facts as a reminder, rather than as part of a lesson in pure

geology? We all know that we have to go back to the beginning with our younger geological pupils; but no opportunity should be thrown away of enforcing the truth that all knowledge of the attractive "natural" sciences must be founded on the accurate work of chemical and physical laboratories. So long as the dubious adventures of a past mythology are taught in secondary schools, while the fundamental laws of God's world round us are left untaught, so long must we go on repeating that "popular science" in the highest sense, is an impossibility in the British Isles.

Prof. Watts, like others before him, makes the best of a bad business—and makes, indeed, a very attractive best of it. We should have preferred to throw Chapter II. (on the "Study of a piece of stone") and Chapter X. (on "Minerals") into juxtaposition; but that might have deterred some readers from going further with the work. As it is, we find between these chapters a good deal of information based upon outdoor observation. The treatment of river-deposits, and, later, of the origin of river-courses (pp. 311, &c.), seems to us a good example of the scientific and thoughtful character of the book.

If we add a few notes for the second edition, it is in the sure knowledge that it will soon be called for. On p. 54 we should like a definition of the term *roche moutonnée*—and the correct explanation of it, as derived from the frizzly surface of wool. On p. 119, the so-called "rare" elements are said to be uncommon in rocks. Should we not now-a-days regard the word "rare" as referring to their distribution in very minute quantities, rather than to their absence? On p. 120, the term "acid" is used in a sense not always sanctioned by modern chemistry. On p. 128, the plane of composition in twin-forms should, we think, have been left unnoticed, if it had to be styled a "divisional plane," without further explanation; it would surely become confused with cleavage. On p. 122, the tetragonal prism is got by elongation of a cube, without note as to the difference in the position of the lines selected as lateral axes. On p. 172, "Tachylite," for "tachylite," with an erroneous derivation, appears—as it does in almost every work, despite the protests of twenty years. On p. 190, the quartz, felspar, and mica of gneiss, are said to occur in alternate layers; this, again, is a very common statement, but is quite at variance with fact. The proportions of the constituents vary enormously in different layers of gneiss; but the layers consist of different types of rock, rather than of distinct minerals. On p. 210, the Lower Cambrian corals of America are overlooked. On p. 249, the position of the siphuncle might have been made the important point in *Clymenia*, which otherwise might fall in with the *Goniatites*.

These are the trifling things that we have dropped on in this capital little book. The author's friends and readers will be glad to know that he has again a wide field open to him in his new teaching duties in the nucleus of the Midland University.

G. A. J. C.

IRELAND NORTH AND SOUTH.

Tours in the North of Ireland. Official Guide to the Belfast and Northern Counties Railway, the Giant's Causeway and the Antrim Coast. pp. 172, maps and illustrations. Belfast: W. and G. Baird, Ltd., 1898. Price 6d.

The Sunny Side of Ireland. How to see it by the Great Southern and Western Railway. By JOHN O'MAHONY. pp. 236, 7 maps and 130 illustrations. Dublin: A. Thom and Co., Ltd. Price 1s.

All well-wishers to our country will welcome the enterprise shown by the Irish railway companies in endeavouring to spread information and invite visitors by the issue of such attractive guide-books as those now before us. A few months ago Mr. Praeger's Guide to the Co. Down district was noticed in our columns; it is encouraging to find that other parts of Ireland are being similarly popularised.

The Northern Counties Guide consists for the most part of clear topographical information on the country lying between Belfast and Londonderry, with brief and reliable historical notes. The distances between the various points of interest, methods of communication, boat and car fares are given in commendable detail, and the reader is allured to visit the scenes described by the fine series of Mr. Welch's photographs which illustrate the book. The information regarding the line, its stations, hotels, cloak-rooms, book-stalls, and similar accessories to the comfort of travel will be found of value. We notice, however, that of eleven articles quoted as sold at the Company's refreshment-rooms, only one (bread and butter) is a food, while there are seven different kinds of intoxicants; this will not attract the hungry. And it is with regret that we observe that only first class passengers can obtain luncheon or dinner on the trains.

Naturalists will be most attracted by the closing pages of the book, where they will find a concise geological history of the district with special reference to the scenery by Prof. G. A. J. Cole, a short survey of the flora by Mr. Praeger, and archæological notes by Mr. W. Gray. It is a healthy sign that the attention of casual tourists should be called to the meaning of the natural objects by which they pass; a landscape becomes far more interesting when the gazer has some glimmering of how it has come to be. We rejoice to see geology and botany thus pressed on the traveller's notice, but why should zoology be altogether passed by? The waters of Belfast Lough, made classical ground to the naturalist by the researches of Thompson and his colleagues, the bird-haunted shores of Lough Swilly, the presence of such rarities among British moths on the Antrim and Derry coasts as *Heliothis scutosa*, and *Nyssia zonaria* were surely worthy of mention.

The Southern Guide is in many respects a contrast to the Northern—more rhetorical, more poetical, less business-like. Details of routes and fares are given in connection with the Killarney and Kenmare districts; but many towns are passed by with a mention of the objects of interest, bright historical and poetical allusions, and no instructions how the sights are to be seen. The rhetoric at times defies the laws of physics, as when we are told (p. 70), that “the distant mountain of Cahercouree sees his regal head reflected in the sea.” But no reader can fail to catch the enthusiasm of the writer for the beautiful land he describes, and it is not possible to praise too highly the reproduction of the photographs which illustrate the book; the clearness of detail even in the smallest vignettes is admirable. Indeed the general appearance of the pages is most pleasing.

Like the Northern Guide, this also contains chapters on the botany and geology of the district, but instead of entrusting these to specialists, Mr. O'Mahony has compiled them himself. In the botanical chapter, closely following the late A. G. More's paper in Guy's “Cork,” he can be charged with nothing worse than neglect of recent work, as when he states that Co. Cork is the only locality in Europe for *Spiranthes Romanzoviana*. But in the geological chapter we are informed that “the epoch of the greatest upheaval of the Alps,” during which “the surface of Ireland assumed its present appearance” occurred “before the close of the Palæozoic era, since Eocene and probably at the end of Miocene times (!)” After this startling introduction, Mr. O'Mahony settles down to follow Prof. Cole's recent articles on Irish geology published in *Knowledge*, reproducing several of his maps and sections in illustration. As in the Northern Guide, zoology is altogether neglected; the Kerry Slug and the Natterjack Toad will not be disturbed by the tourist who relies on the present book for his knowledge of the natural features of the country. How much light needs shedding on natural objects was brought home to us the other day in the Railway Hotel at Killarney. In a list of excursions, hung on the walls, visitors are gravely informed that the Devil's Punch-bowl under Mangerton—a cirque hollowed out of Old Red rocks—is “the crater of an extinct volcano!” Perhaps the authority for this is also responsible for the relegation of Eocene and Miocene to the Palæozoic era. May a new edition of Mr. O'Mahony's guide soon appear with a less revolutionary classification of the rocks.

G. H. C.

BRITISH MYCOLOGICAL SOCIETY.

The second annual meeting of this Society was held in Dublin on September 19th to 24th. It may be characterised as having been a week of hospitality and hard work. So eager were some of the members to see what Ireland could produce in the way of fungi that the Secretary, Mr. Rea, Mr. Rose, Mr. Stretton, and the acting President, appeared in Dublin three days before the advertised time. They were met on their arrival by the local secretary, Dr. T. Johnson, and by the veteran Irish mycologist, Mr. Greenwood Pim. On the following day the Yorkshire contingent arrived, Messrs. Crossland, Soppitt, Clarke, and Bearstow, followed shortly after by Mr. G. C. Hughes, of Chesterston, and Dr. Peacock, of Malvern. Monday, September 17, saw the party *en route* for Howth. A ramble in a damp glen was soon rewarded by finding *Hydnum udum*, a tuber, probably *Hydnotria Tulasnei*, but it was not quite mature; *Cynophallus caninus*, *Naucoria erinaceus*, a group of magnificent specimens of *Lepiota acutesquamosa*, gave the mycologists an indication of what the Irish woods could produce.

In the evening a meeting was held in the Botanical Laboratory of the Royal College of Science, where the work of naming the specimens was begun in good earnest, microscopes and text-books being in considerable demand. Mr. Swan exhibited a magnificent series of photographs of the *Saprolegnia*, Mr. Greenwood Pim showed some specimens and photographs, and Dr. McWeeney exhibited various cultures of fungi.

On Tuesday, the 20th, the party, now augmented by the members of the Dublin Naturalists' Field Club, started off for Powerscourt, under the guidance of Dr. Johnson in search of *Gyrodon rubellus*, which Dr. McWeeney had found some few years previously. The spot was found, but not the fungus. A few stopped behind, and examined the ravages caused by *Polyporus fomentarius* upon some splendid Beech-trees. It was interesting to compare the effect of *P. fomentarius* on Beech with what was seen last year at Worksop of *P. sulphureus* on Oak. *P. sulphureus* gets into a tree, and destroys the middle of the trunk, leaving it sound outside. *P. fomentarius* seems to vent its energies in destroying the exterior of the tree, fine trunks having a third or a quarter of their circumference killed from the ground upwards from 10 to 15 or 20 feet. Numerous specimens of the *Polyporus* were *in situ*, some of which Mr. Clarke, of Halifax, photographed. The rare *Polyporus Wynnei* was also found, as well as the beautiful *Marasmius Hudsoni*.

A good company dined in the evening at Russell's Hotel, and adjoining to the large theatre of the Royal College of Science, the chair being taken by Mr. R. Ll. Praeger, the President of the Dublin Naturalists' Field Club. The absence of the President of the British Mycological Society, Mr. G. Masee, was regretted. It fell to the lot of Dr. Plowright to take his place, and the Society did him the honour of electing him their President for the ensuing year. In the evening he delivered his Presidential Address, which was a critical discussion of certain fungi figured in Cooke's "Illustrations."

Wednesday morning was spent in working at the herbarium, in opening consignments of fungi which now came to hand from all parts of Ireland and from some parts of England as well. The afternoon excursion to Brackenstown, near Swords, was duly carried out. The Rev. W. L. W. Eyre and Miss Eyre, from Hampshire, joined the party. As soon as the grounds were entered the rain began to come down at first gently, then steadily, then heavily, but it made no difference to the workers. *Spharia mammiformis*, *Agaricus pisciodorus*, *Polyporus obducens* and *vitreus*, were found. At the evening meeting a paper was read by Mr. Wager, as well as Mr. Crossland's communication on "The Mycological Flora of a discarded Hearth-rug."

Thursday was spent in the grand woods of Avoca. Some of the party walked to see the "Meeting of the Waters," eulogised by Moore; others contented themselves with finding *Boletus parasiticus*, *Russula lepias*, *Agaricus jubatus* and *pantherinus*, and *Helotium æruginosum* in magnificent fruit. In the evening more papers were read, including an "Epitome of Eriksson's Researches on the Cereal Rusts."

Friday morning was devoted to work in the museum: the afternoon to an excursion to Lucan, where the find of the day fell to Dr. Peacock, of Malvern, in *Agaricus strobiliformis*. Mr. Soppitt also picked up *Cortinarius fulgens*, new to Ireland. The tired fungologists were refreshed by afternoon tea through the considerate kindness of Miss Hopkins, of Lucan. In the evening, Dr. E. J. McWeeney read a paper on the "Sclerotium Disease of Potatoes"—a malady which, he said, was very widespread in certain districts especially along the western and north-western seaboard of Ireland. This disease assumed two distinct forms—one characterised by large sclerotia hanging loosely in the pit-cavity of the affected Potato-plant—the other by small crumpled inconspicuous sclerotia firmly adherent to the epidermis of the leaves and stem. He concluded by saying, that though neither of these diseases was so much to be dreaded as the *Phytophthora*, yet in certain districts they did a great deal of damage to the crop.

Mr. Greenwood Pim exhibited some lantern-slides of fungi, which were greatly admired. Mr. Soppitt made a communication on the Gooseberry *Æcidium*, a much commoner disease in Ireland than in England. The life-history of this fungus he has been working at for some years. Mr. Rea read a paper on the "Different Names applied by English and French mycologists to one and the same Basidiomycete." The Saturday excursion was to Dunran, where Mr. Patterson had found *Boletus porphyrosporus*.

A list of 160 additions to the fungus flora of Dublin and Wicklow by Mr. Carleton Rea, the Honorary Secretary of the Society, will appear in our December issue.

PROCEEDINGS OF IRISH SOCIETIES.

ROYAL ZOOLOGICAL SOCIETY.

Recent gifts include a Snake from Dr. E. J. McWeeney, a Jackdaw from Mr. G. Kinahan, a pair of Foxes from Major S. Bruce, a Kestrel from Mr. J. Hunter, a Seal from Mr. R. M. Fleming, and a West African Python from Mr. J. E. Egerton. Two Golden Agoutis have been born in the Gardens; while two Golden Eagles, two Mandrills, two Burmese Apes and four Sooty Mangakys have been bought.

12,380 persons visited the Gardens in September.

CORK NATURALISTS' FIELD CLUB.

OCTOBER 11.—A *conversazione* was held in the School of Art in conjunction with the Cork Historical and Archæological Society. A large number of exhibits were on view, including many objects of much historical interest contributed by Robert Day, butterflies by W. Humble Johnson, jelly fishes by the Misses Delap, botanical specimens by E. B. Hughes; J. L. Copeman (President), was in charge of microscopes lent by a number of members. Mr. R. Welch, of Belfast, contributed a fine series of lantern slides. At the annual meeting of the Archæological Society, which was held during the evening in the lecture theatre, the President of the Field Club gave an account of the Club's work during the past year, and announced that during the coming winter under the Field Club Union lecture scheme, Dr. Alcock, of Dublin, would read a paper on bats, and Mr. Praeger would give an illustrated account of the recent Field Club Conference at Kenmare.

NOTES.

In *Science Gossip* for October will be found a short article on Field Club work in Ireland, by the Editor, Mr. Carrington, *à propos* of the Kenmare Conference, illustrated by a reproduction of one of the illustrations which appeared in our September number.

A detailed natural history survey of the long sand-bank known as the North Bull, in Dublin Bay, recently undertaken by Messrs. Praeger and Halbert, is turning out unexpectedly interesting from a zoological point of view, as this apparently inhospitable spot has already yielded several additions to the Irish fauna.

The classical locality of Portrane, the Ordovician Mecca of the Irish palæontologist, is being considerably altered owing to quarrying operations in the limestone, connected with the building of the new asylum in the neighbourhood.

Dr. H. Lyster Jameson is working through the winter at the Naples Biological Station, where he occupies the British Association table.

All interested in Irish fish and fisheries will be glad to know that Mr. E. W. L. Holt has returned to this country to undertake a five years' research on the life-history of Mackerel, under the auspices of the Royal Dublin Society. His headquarters will be at Berehaven, where a ship is to be fitted up as a floating laboratory.

BOTANY.

Records of Irish Plants.

We have received the *Reports* of the Botanical Exchange Club of the British Isles for 1896 and 1897, the former delayed by the illness of Mr. Arthur Bennett. Both reports contain notes of some critical Irish plants collected by Mr. Charles Baily, Rev. E. S. Marshall, S. A. Stewart and Rev. E. F. Linton, in Antrim, Mayo, Wexford and Westmeath.

Additions to the Flora of Howth.

Two plants of *Lathyrus Aphaca* were found on the railway bank near Sutton Station by Miss Ethel Moore in July last, and I have found several plants of *Hottonia palustris* in the cuttings in swampy ground on the top of the hill above Baily Post Office.

Howth.

RACHEL M. MAHAFFY.

[Can any of our readers account for the appearance of the Water Violet on the Hill of Howth? It must have been deliberately introduced at a recent date. The Yellow Vetchling presumably came with imported seed.—EDS.]

Sisyrinchium angustifolium at Coosheen, Co. Cork.

In June of this year, while staying at Coosheen, near Schull, Co. Cork, we found a small colony of *Sisyrinchium angustifolium*. The plants were growing a few inches from the side of a very wild country road, on the margin of a bit of waste ground, which sloped down to a stream; they were few in number, and almost hidden by a spray of bramble which drooped over them. It is highly improbable that the *Sisyrinchium* can here be other than wild, as the district is mountainous, very desolate, and sparsely inhabited, while the by-road beside which it grew is little used, and quite remote from cultivation, even the nearest cottage being at a considerable distance.

As the plants were few, it is probable that *S. angustifolium* may only recently be located there, a view which is rendered the more likely by our failing to find any other specimens, although we searched the neighbourhood. We carefully left it undisturbed, and hope to find the little colony increased on our next visit. As the station is at a distance from the other spots in which the plant has been recorded, its location at Coosheen is of interest. The plant was identified for me by Prof. Johnson.

Dundalk.

LILIAN M. SWAN.

ZOOLOGY.

INSECTS.

***Dasydia obfuscaria* In Co. Donegal.**

While collecting on Dowros Head, near Glenties, Co. Donegal, my brother and I took a fine specimen of *Dasydia obfuscaria* flying near Ragwort, on the sea-shore.

This seems to be the first authentic record of this moth from Ireland, as it is omitted by Mr. Kane from his Irish list, on the grounds of want of evidence, since the only previous records are one in Birchall's list of its capture in Wicklow by Bristow, and an incidental reference by Birchall in the *Entomologist* of 1867 to its occurrence in Kerry. This Scotch insect is interesting, as an addition to the number of northern species which are found on the west coast of Ireland. The specimen is now in the Dublin Museum.

Templeogue, Co. Dublin.

G. P. FARRAN.

***Sphinx convolvuli* in Ireland.**

A flight of *Sphinx convolvuli* has made its appearance in England, and captures have been made of this occasional visitant in many places. Ireland, too, has not been without its share of arrivals, as Major Tenison has captured one at Lough Bawn, Co. Monaghan, attracted by the flowers of *Lilium auratum*; while at Dromoland Castle, Co. Clare, the Hon. Edward O'Brien has taken two specimens. We shall, doubtless, hear of its occurrence in many other parts of Ireland.

Drumreask, Monaghan.

W. F. DE V. KANE.

***Piezodorus lituratus* in Co. Tyrone.**

Examples of this plant-bug were found at Ardhea Rectory in September by Miss Garnett, feeding on Bramble in a bog. I sent the specimens to the Rev. W. F. Johnson, who kindly named them for me.

Knocknacarry, Co. Antrim.

S. A. BRENNAN.

MOLLUSCS.

***Hydrobia Jenkinsi*, Smith, in Co. Down.**

During a few hours visit to Newry one day this month (July) I found this species living in immense numbers with *Planorbis spirorbis* and *Limnaea peregra*, among Watercress and other plants in fresh-water drains in the long-reclaimed estuarine flat below the Moor Quarry, on the Warrenpoint road. All the specimens, so far as I have examined them, are the type—without the keel—like those Mr. Milne found (see *Irish Naturalist*, June, 1898), at St. Johnstone, Co. Donegal, where the river is practically fresh. Is it possible that the carination increases with the amount of salt water present? It seems to be so in the Bann and Foyle.

Belfast.

R. WELCH.

BIRDS.

Curlew Breeding near Bray.

It may be of interest to state that I had a nest of this bird under my observation this summer. It succeeded in the face of many difficulties in bringing away its young. This is the first instance I have met with of such a bird as the Curlew breeding near Bray.

Trinity College, Dublin.

E. BLAKE KNOX.

MAMMALS.

The Whiskered Bat in Co. Dublin.

On September 23rd, while searching for the hiding-places of bats in a ruin, known as Fountain Hill, near Kilternan, Co. Dublin, I found this bat (*Vespertilio mystacinus*, Leisler), in a hole between the plaster and the wall; the bat was lying on the floor of the cavity and was easily caught. I also found two other bats of the same sort in the entrance of a hole between two large stones in the wall; one of them I also caught. They were identified by Dr. Alcock.

Ballybrack, Co. Dublin.

J. WELLAND.

On September 30th I had the good fortune to come across a male specimen of this bat (*Vespertilio Mystacinus*, Leisler), in a little wooded ravine near Kilternan, Co. Dublin. It had suspended itself at the top of a narrow chink between two great blocks of stone, about 6 feet from the ground, and hung close to the entrance, though not visible from the outside. It was apparently alone, as I could find no more specimens either in the same chink or in several others close by. I was able to capture it without injuring it in any way, and conveyed it to Merrion where it now lies.

This species does not by any means display the gentle spirit manifested by Daubenton's bat in captivity. It refuses all friendly overtures, screaming and biting where occasion offers, its cry being much lower in pitch than that of other species. It drinks water occasionally, and eats sparingly of fish, when little morsels are placed in its mouth, but declines raw meat, apparently finding it difficult to masticate. The last day or two (Oct. 7th) it has seemed sleepy and disinclined for exertion, possibly it intends to hibernate.

With the exception of Mr. Welland's specimens, recorded above, this bat has not been previously observed in Co. Dublin, the former Irish localities being Clare, Fermanagh, and Louth (H. L. Jameson, *I. Nat.* Feb., 1896). In Wales Mr. C. Oldham records it from Carnarvonshire (*Zool.* (3), vol. xx., p. 255), and Mr. Caton Haigh from Merionethshire (*Zool.* (3), 1887, p. 144). It has been found twice in Scotland (see Harting, J. E., *Zool.* (3), vol. xvii., p. 426, and (3), vol. xii., p. 161), and has a widely scattered distribution in England, occurring in nineteen counties.

Trinity College, Dublin.

N. H. ALCOCK.

CYBELE HIBERNICA.*

"Many generations of Men are come and gone from this Earth . . . yet the Earth itself with its verdant Furniture abideth for ever."—
THRELKELD, *Synopsis Stirpium Hibernicarum*, 1726.

As the new *Cybele Hibernica* lies open before us, filled with the plant-lore which many generations of botanists have laboured to acquire and to set forth, our minds wander back through the dim galleries of time; from the present, with its cut-and-dry knowledge of the flora of our country, to those pre-Linnean days when Caleb Threlkeld ("the Science of Botany being not only generally useful, but even absolutely necessary to us mortals" in his opinion), showed his appreciation of its importance by compiling the first Irish Flora one hundred and seventy-two years ago. Irish botany was an almost unknown field when the old clergyman-physician published his modest duodecimo, with its cumbrous names, its grave herbalistic instructions, and its scanty plant-localities. No doubt its compilation absorbed many a studious hour, as the author sat in his house in Dublin, and frequently occupied his thoughts, as he "used to wander through the woods and dales" with Ray's *Synopsis* under his arm, or "perambulate in Company of ingenious Men, to have ocular Demonstration of the Plants themselves in their native Soil." In one respect at least the good doctor set an example which many of his successors might well have followed up. He took pains to find out and record the Irish names of the plants of which he wrote—an important feature absent from almost every Irish Flora published since, and the inclusion of which forms one of the pleasantest features of the new *Cybele*. Nine years after the appearance of Threlkeld's work, John Keogh published his *Botanologia Hibernica*, but this book was almost purely a herbal, and did little to advance the knowledge of

* **Contributions towards a Cybele Hibernica**, being outlines of the geographical distribution of plants in Ireland. Second edition, founded on the papers of the late ALEXANDER GOODMAN MORE, F.R.S.E., F.L.S., M.R.I.A., by NATHANIEL COLGAN, M.R.I.A., and REGINALD W. SCULLY, F.L.S. Dublin: Ponsonby; London: Gurney and Jackson, 1898. 8vo. pp. 96 + 538. Map. 12s. 6d.

plant-distribution in Ireland, nor did Ruttty's *Essay towards a Natural History of the County of Dublin* (1774) do much in that way either. A great advance was, however, made in 1794, when Walter Wade, first Professor of Botany to the Dublin Society, published the earliest Irish County Flora—*Catalogus systematicus Plantarum indigenarum in comitatu Dublinensi inventarum*; and when he followed this up in 1804 with his well-known *Plantæ Rariores in Hibernia inventæ*, and induced the Society to found a Botanic Garden at Glasnevin, no doubt Irish botanists considered that they had now abundant means at their disposal for the study of their favourite hobby. But the Irish plant-list was still very incomplete, and two or three localities were all that even the most interesting species could boast. Twenty years later that industrious Scotchman, James Townsend Mackay, first curator of Trinity College Botanic Garden, presented to the Royal Irish Academy his important *Catalogue of the Indigenous Plants of Ireland*, "the result of twenty years observation during numerous excursions made to almost every part of the country that was likely to afford interesting matter to the Botanist." This was published in vol. xiv. of the *Transactions* of the Academy.

Mackay's list is the first enumeration of Irish plants that has any claim to completeness, and as such its appearance marked a distinct forward step. Meanwhile John White, of Glasnevin Botanic Garden, an enthusiastic field-botanist, had amassed a considerable body of plant-records as the result of excursions to various parts of Ireland, and Miss Katherine Sophia Baily (afterwards Lady Kane), then twenty-two years of age, edited and published these in *The Irish Flora* (1833) adding a brief description of each plant, and suitable references. This little book must rank as the first Flora of the country, in the modern acceptance of the term. *The Irish Flora* was destined to have but a short reign, for three years later Dr. Mackay brought out *Flora Hibernica*, on which he had been engaged for many years; a comprehensive work, including not only the flowering plants, for which he himself was responsible, but the mosses, hepatics, lichens, and seaweeds, edited by Dr. Taylor and W. H. Harvey. The researches of Templeton and Drummond were now given to the public, and the many discoveries recently made by Mackay's late pupil,

David Moore, at that time engaged on Ordnance Survey work in Antrim and Derry, and also Miss Hutchins's important work among the southern Algæ. Now came a lull in the publication of books on Irish botany, only broken by a useful list of Cork plants by Dr. Thomas Power in *Contributions towards the Fauna and Flora of Cork* (1845). But things were ripening for a very great advance. A. G. More, in the course of frequent visits to Ireland, had become deeply interested in the natural history of our country; an interest deepened by his ripening acquaintance with David Moore, who was now curator of Glasnevin Botanic Garden. In England, H. C. Watson had set a splendid example in his *Cybele Britannica* as to how the flora of a country should be worked out. Early in 1864 the fateful entry occurs in More's journals, "proposed an Irish Flora to D. M." Dr. Moore warmly espoused the suggestion. No time was lost in carrying out the scheme. Both authors vigorously explored the more interesting and less known parts of Ireland. The publication of Tate's *Flora Belfastiensis* in 1863, and Dickie's *Flora of Ulster* in 1864, supplied many northern localities; F. J. Foot's researches on the unique flora of Burren came in opportunely; a host of correspondents were pressed into the service; and in August, 1866, *Cybele Hibernica* was an accomplished fact. It is difficult for us to appreciate at the present day the enormous service rendered to Irish botany by the production of this work. The scattered and chaotic records of the Irish flora were at once reduced to order; and for the first time the botanist could obtain a definite idea of the distribution of native plants in the country.

But botanical research did not pause with the publication of *Cybele*. The possession of such a book was in itself the strongest incentive to work in unexplored regions or among unstudied plants. And, moreover, there was behind all the powerful influence of More urging on the younger men whom he knew so well how to reach and how to stimulate. While Dr. Moore pressed forward his researches in Irish mosses and liverworts, and More continued his rambles in the West, H. C. Hart began the long series of explorations of the mountain-ranges, islands, and rivers of this country which

have made his name familiar. R. M. Barrington botanised Ben Bulbin, Lough Ree, and Lough Erne, the former two in conjunction with R. P. Vowell. S. A. Stewart surveyed Lough Allen, Rathlin Island, and the Shannon mouth. Dr. Scully commenced his successful researches in Kerry. T. H. Corry was engaged in exploring Lough Gill when he lost his life. N. Colgan began a detailed survey of county Dublin. H. C. Levinge made the important discoveries in Westmeath which he has recorded in this Journal. G. E. H. Barrett-Hamilton, C. B. Moffat, and Miss Glascott did good work in Wexford. R. A. Phillips attacked the large and interesting county of Cork.

In 1888 Stewart and Corry's *Flora of the North-east of Ireland* appeared—a large and valuable contribution to the Irish flora—followed in 1895 by a voluminous Supplement. Ireland was favoured too by predatory incursions, as in days of yore, from across the channel. A number of well-known English botanists—H. and J. Groves, E. S. Marshall, F. J. Hanbury, W. A. Shoolbred, E. F. Linton—visited different parts of our island, and contributed materially to the working-out of difficult and critical plants, which had not been fully studied in Ireland. And now at length we have the new edition of *Cybele Hibernica*, edited by two of the ablest botanists in the country, embodying all that is valuable in previous works, the whole mass of information above referred to, and much original research besides.

Of the book itself it is impossible to speak too highly. The deeper one dips into it, the more apparent become the care and accuracy shown on every page, the masterly grasp of Irish botany displayed by the editors, the critical sifting which has been applied to the great mass of material dealt with. It gives keen pleasure to take some favourite genus or species and examine the manner in which it is treated, and to note the judgment and lucidity which are constantly exhibited. Every portion of the book improves under a minute and rigid scrutiny; and if, in any of the following pages, we appear to carp at trifles, it is because the broader features of the book are really above criticism, and its very excellence causes a temptation to magnify details.

We naturally begin by comparing the new *Cybele* with the old. Here two features at once strike our attention. The first is the fact that we are dealing not with a new book, but with a new edition of the old. Every feature of Moore and More's now classical work which it was possible to retain has been lovingly preserved. We see this in the form of the introduction, in the table of distribution, in the arrangement, and even the type of the body of the book. And it is a high compliment to the excellence of the judgment of Moore and More in such matters, when we say that the new edition, published thirty-two years after, loses nothing by the perpetuation of these features. In this connection, however, we would express our regret that the names of the authors of the original edition should have vanished from the title-page. More's name, indeed, occurs in the statement that the second edition is founded on his papers; but the names of Moore and More as creators of "*Contributions towards a Cybele Hibernica*" are conspicuous only by their absence. A change of a more cheerful nature is seen in the beautiful map, executed in Messrs. George Philip & Son's best style, which faces the title-page. The map in the old edition was useful only for showing the boundaries of the twelve Districts, and if we wanted to discover the situation of any place it was necessary to consult an atlas or map of Ireland. The new map shows mountain-ranges, rivers, lakes, towns, railways, and canals as clearly as could be desired, the twelve Districts being coloured and numbered. The numbers of the Districts are now printed in Roman instead of Egyptian numerals. This is a distinct improvement, bringing the work into line with Watson's botanical map of Great Britain, and leaving the way clear for the employment of Egyptian numerals for the county-divisions. But since the counties are not distinguished by colour, the county boundaries might have been more clearly marked. The eastern limit of a number of the "*Hibernian*" type plants is shown by lines as on the old map, a few species being now omitted for various reasons. Another change, but one which we cannot regard as an improvement, is the relegation to an Appendix of all plants not admitted by the editors as members of the permanent flora. In this, the

rubbish-heap of Irish botany, casuals, mistakes, plants not fully naturalized, introductions, and suspicious records, find a common grave. We much prefer the arrangement in the old edition, where all such plants appear in their proper places, branded with a different type and a square bracket. The line which separates fully naturalized plants from ones which are still on their trial is such a devious and arbitrary one, that the effect of this separation is that we have often to try in two places before we find the plant of which we are in search. A single list must ever be the most convenient way of displaying a flora.

The other point which at once strikes one on contrasting the old edition with the new is the vast advance which the latter displays in our knowledge of plant-distribution in Ireland. The extensive botanical survey work which has been carried out during the last twenty years has resulted in a great deal more than a mere piling up of records; it has defined the distribution in Ireland of a large number of species, the range of which previously appeared discontinuous and indefinite. Compare, for instance, *Leontodon hirtus* and *L. hispidus* in the old and new editions, or *Juncus obtusiflorus*. Note, likewise, the extensive distribution now given for *Potamogeton Zizii* and *Carex aquatilis*, two plants which do not appear at all in the first edition. The number of plants recorded from all twelve Districts is in the new edition very largely increased, and includes many that are by no means common, and are certainly not universally distributed in Ireland. This fact suggests, as remarked by the editors in the introduction, that the time has arrived for a further step in the working out of the distribution of the Irish flora by means of a more detailed botanical subdivision of the country.

Another proof of the advance of our knowledge is shown in the fact that the Characæ, which did not appear in the first edition, are now published with a goodly show of localities from the length and breadth of our island.

Let us now turn over rapidly the pages of the book. The preface tells how the work of bringing out the new edition was bequeathed to the present editors by A. G. More—a labour of

love which has been splendidly carried out. The editors draw attention to the new features which they have introduced into the book. To these we shall refer as we meet with them; every one of them furnishes a marked improvement—with the exception, we think, of the Appendix, to which reference has already been made. Thanks are tendered to a long list of friends and helpers, with a special reference to the influence of A. G. More on the progress of Irish botany during the last quarter century. The list of plants added to the flora during that period is smaller than one might expect—18 Flowering Plants and 6 Characeæ. Many of these are critical plants, and half a dozen of them of more or less doubtful standing as natives. This gain to the Irish flora is more than balanced by the number of plants now excluded for one reason or another. The preface to the first edition is next reproduced, followed by a list of the principal books, papers, &c., referring to Irish botany. This is a most useful catalogue, covering 18 pages; it seems to us a very great pity that it was not extended—only a few additional pages would have been required—and made a complete bibliography of Irish botany. That desideratum has still to be supplied. In this list, which is wisely arranged in alphabetical, not chronological order, we are somewhat surprised to find the *Journal of Botany* inserted under *Botany*, and the *Proceedings* of the Royal Irish Academy under *Irish*: this is not sound indexing.

The introduction contains concise sections devoted to physical features, climate, comparison of Irish and English floras, Irish plants not found in Great Britain, prevalent orders, endemic plants, topographical groups, Irish botanical districts, botanical map, and explanatory notes on the text. The introduction is always the most difficult part of a work of this kind, and in this case it is excellently well done. It is graphic and clear, and each section displays the best of all merits—brevity. The most interesting portion is certainly that which deals with the peculiar plants of the South-west—the Cantabrian and North American groups, and other plants of “Hibernian” type. The Irish and foreign distribution of these is indicated, and the pre-glacial land-connection theory is put forward to account for their presence.

The table of distribution follows exactly the form adopted in the old edition. It might have been clearer and have looked better if the unnecessary vertical lines had been omitted, and if a dash or double dot had been inserted in each space not occupied by a number. In genera of sparse distribution, such as *Rubus* or *Hieracium*, it is impossible to carry the eye horizontally across all the blank spaces and accurately pick up a "12" at the opposite edge of the page. The table well shows our increased knowledge of Irish plant-distribution. Taking a couple of typical orders, we find that the district-records in the new edition run from 20 to 30 per cent. more than those in the old.

To come now to the main part of the book. Though in general arrangement and appearance it closely resembles the old edition, a number of important points invite comment. First, as to nomenclature. On this important subject, the editors had best be allowed to speak for themselves:—

"A widely familiar and long established name has always been allowed to stand when the only reason to be urged against its retention was the existence of an earlier published name, long since become obsolete and never admitted to general currency. Whatever may be the final result of the resuscitation of such obsolete or still-born names in obedience to the strict letter of the law of priority, the immediate effect must be to cause that confusion which the law was designed to prevent or to remove." Thus, the familiar names of the first edition are in many cases with us still, and we cannot say we are sorry to see them; they stand like friendly beacons amid the troubled sea of Hawkweed and Bramble segregates, and recall the happy days of childhood, when *Flowers of the Field* supplied our simple needs, and St. Dabeoc's Heath was *Dabcocia*, and the Sand-Spurrey was neither *Buda* nor *Tissa* nor *Corion* nor *Lepigonum*. Another point concerning nomenclature, and one which we welcome as one of the most charming and important novelties in the book, is the citation of the Irish names of plants, when such were obtainable. The names are printed in Celtic character, with a phonetic English rendering, and a translation where such was possible. Many of these names are both apt and picturesque. The

Harebell is *Mcaracán gorm* (Blue Thimble), the Foxglove *Meirinighe pluca* (Fairy Fingers), the Water-Lily *Dhuilleoghuidhe bhaitighe* (Drowned Leaves). The name of *Lycopodium Selago* is *Crubinighe Siannach*, the Fox's Paws, and of *Saxifraga umbrosa*, *Cabáiste mhadaidh ruaidh*, Fox's Cabbage, or *Cabáiste daoine matha*, the Good People's Cabbage—a romantic linking together of the plump rosettes of this lovely plant with the inhabitants, real or traditional, of its mountain home well worthy of the vivid Celtic fancy; and how much more suitable and more euphonious than "London Pride."

Another new feature is the employment of a formula to show the relations of plants and soils. It is well known that many species display a marked preference for or aversion to lime; and in Ireland, with its great limestone plain and masses of other rocks lying around it, this factor plays an important part in the distribution of the flora. The classification of the species according as they are more or less strongly calcicole or calcifuge therefore distinctly adds to the interest of the book. As regards vertical distribution, great advances have been made in our knowledge of late years, thanks chiefly to the labours of Hart and Colgan; and the information given under this head is in most cases as complete as could be desired. The formula used for the citation of published records is distinctly ingenious, and furnishes perhaps as practical a solution of a difficult question as could have been adopted. The problem is to give in as few words as possible not only the name of the finder of a plant, but the date of discovery, and a clue to the published record. Our editors cite the finder's name and the date of publication, which is usually approximately the date of discovery; by referring to the list of papers in the earlier part of the book, the full reference may be obtained, if required, from these data.

In the enumeration of localities, the historical aspect of Irish botany is kept conspicuously in the front, and the oldest records are in all cases reverently preserved. Thus under *Arbutus Unedo*, half the space devoted to citation of records is occupied with quaint extracts from the earliest observers, from Parkinson (1640) to Mackay (1806). When dealing with

a large district, however, the chronological arrangement of records is not without its disadvantages. Under District V., for instance, we sometimes find notes from the counties of Kildare, Dublin, Meath, and Louth all jumbled up together. We should have preferred a more geographical arrangement, stations in one county being at least kept together. There is a slight and not unnatural tendency to expand disproportionately Co. Dublin records, though the metropolitan county is one of the smallest, and not exceptionally interesting. Under *Galeopsis angustifolia*, for instance, 12 lines out of 20 are devoted to Dublin. The final remark "not unfrequent in Co. Dublin" might have sufficed. *Lamium album* is "frequent in Co. Dublin," and "frequent in North-east Ireland"; a number of Dublin localities are quoted, but none for Down, Antrim, or Derry, in which, as a matter of fact, the plant is quite irregularly distributed.

The interest of the records quoted is frequently greatly enhanced by valuable generalizations and critical notes—see, for instance, under *Saxifraga Geum* and *S. umbrosa*. In some instances a vast amount of confusion is now cleared away—note, as an example, the orderly arrangement which *Equisetum variegatum* and its forms now assumes. In the case of many of the interesting "Hibernian" plants, a suggestive note on the foreign distribution is appended; the un-Mediterranean Mediterranean Heath is a good example, likewise *Juncus tenuis*. A similar note might have been added to the notice of *Euphorbia hiberna*. Under *Pinguicula grandiflora* we find a timely protest against the introduction of native plants into districts where they are not indigenous. Surely the perturbing influences of present-day commerce and agriculture on the flora render the work of the topographical botanist sufficiently difficult, without his having dust deliberately thrown in his eyes by the officious ministrations of ignorant meddlers.

Another of the vexed questions which the editors had to face was the treatment of critical plants. As in the question of nomenclature, a middle course has been steered. Most of the Hawkweeds are treated as good species; most of the Brambles as sub-species. *Euphrasia* and *Alchemilla* segregates are passed over with a general observation on the forms

hitherto detected in Ireland; this may be justified on the ground of our very incomplete knowledge of their distribution; but the sooner a beginning is made of showing their range the better. Varieties and their localities are in most cases given with commendable care; if the rather worthless "varieties" of *Equisetum palustre*, *polystachyum* and *nudum*, are admitted, why not others of as good or better standing, such as *Polygonum Convolvulus* var. *subalatum* V. Hall, the segregates of *Lastrea Filix-mas*, or the varieties of *Salix repens*?

In the Appendix, where the impostor and the houseless immigrant are alike pilloried, we find among the motley rabble some old friends which have seen better days. *Draba rupestris*, once a prized member of our alpine flora, is here, denounced as a dwarf *D. incana*, or worse. *Elisma natans*, which held an honoured place in the first edition, is here too, with "error" written on it. So is the rare *Euphorbia Peplis*, once native in Waterford, now dead and buried. And this list is not only the penitentiary of the impostors and unfortunates of the Irish flora, and the mausoleum of those who have gone before. It is also the pantheon of the great unsuccessful. Here are relegated the hundred and one casuals which foreign trade brings to our inhospitable shores, and plants too which have escaped from the bonds of cultivation. Many of these are mere fleeting waifs, but others have succeeded in securing a place among the native vegetation. Some of the latter we would like to see released on ticket-of-leave, and included in the body of the work, branded, if needs must, with the asterisk which marks the certainly introduced. *Hypericum calycinum*, *Sedum rupestre*, *Petroselinum sativum*, for instance, can make out a good case for admission—as good, perhaps, as *Peucedanum sativum*, *Myrrhis odorata*, and the American *Polygonum sagittifolium*, whose claims have been allowed. We are sorry to find several of the latest additions to the Irish flora consigned to this limbo—*Helianthemum vulgare* from Donegal, *Medicago sylvestris* from Dublin, *Brachypodium pinnatum* from Waterford. We can hardly bring ourselves to think that the last of these at any rate deserves this degradation.

The laborious task of bringing together and arranging the mass of published and unpublished records has been done

with commendable thoroughness. We can hardly point to a single record of any value that is not duly entered. The interesting inland localities of *Scirpus Tabernæmontani* from Lough Neagh (*Flor. N.E.I.*) and of *Carex distans* on Lough Erne (*I.N.*, i., 113) might have been quoted. The Fermanagh record of *Trollius* (*I.N.*, v., 188), calls for mention. *Elatine hexandra* and *Carex xanthocarpa* have been recorded from Armagh (*I.N.*, ii., 184, 215). Since modern confirmation of old records is aimed at it, is a pity that so many early North-eastern records are left unconfirmed.

Errata are similarly remarkably few—and the few that occur only render the absence of others the more conspicuous. Hollywood in Co. Down is spelled *Hollywood* throughout the book. Its mediæval designation of *Sanctus Boscus* shows the correctness of the one “1” in the modern name. The great Island of Aran in Galway Bay is referred to throughout as “Aranmore.” This is a misnomer to which we ourselves plead guilty in past years. It would appear that along the West Coast “Aranmore” always means the Donegal Aran; the largest of the Galway Bay islands being known as “Inishmore” or the “Great Island of Aran.” *Rhynchospora fusca* is stated not to occur east of long. 8°, but Mr. Vowell’s station cited on p. 391 lies 16 miles east of that line. Several unpublished records from Tipperary, King’s Co., Westmeath, and Roscommon, in the writer’s possession, confirm this eastward extension. Brennan’s Glendun (Antrim) record of *Pyrus Aria* is attributed to Barrington and Vowell. The reference to Lett’s find of *Lycopodium clavatum* in Armagh is erroneous. The writer’s Enniskerry record of *Rubus leucostachys* is transformed into “Enniscorthy, Wexford.” Carbury (bottom of p. 402) is in Kildare, not in Meath. *Carduus pratensis* cannot be described as “abundant in the North.” It is certainly common in Donegal, but it is distinctly rare in Derry and Antrim, and is one of the scarcest plants of Down and Armagh. The several colonies of *Carum verticillatum* in North Antrim preclude its being satisfactorily described (p. xlvii) as a species which occurs in the South and West, and is absent from the East.

With a reference to typographical errors this fault-finding may come to a timely conclusion. These again are remarkably

few in a work crammed with Latin and Greek words, and names of places and of people. We only mention one or two, as in the last instance, which as they stand might possibly lead to confusion in the future. Ballyalooley (p. 233) should read Ballyalloly. Derryquinney (p. 274) should read Derrywinny. Thoulagee (p. 460) should be Thonlagee. Shanlieve (p. 443) should be Shanslieve—an important correction, since there is a Shanlieve towards the western end of the Mourne Mountains.

To return to a more congenial subject, it is with pleasure that we draw attention to the excellent manner in which the University Press have executed their portion of the work. No better printed book has issued from an Irish workshop, nor is a more difficult piece of type-setting often handed over to the tender mercies of the compositor. The reputation of the University Press for the turning out of high-class work might safely rest on this book alone.

Our warmest thanks are due to Mr. Colgan and Dr. Scully for the promptitude, care, and judgment with which they have carried out a laborious and difficult piece of work, and we offer them our hearty congratulations on its successful conclusion. Thanks to them and to Miss More, and by no means least to the University Press, we have now a guide to the flora of our native land of which any country might feel proud. And perhaps the most to be congratulated is the Irish botanist, who has the privilege of possessing and of using a work so admirably produced.

R. L.L. P.

ADDITIONS TO MR. GREENWOOD PIM'S "FUNGI OF THE COUNTIES OF DUBLIN AND WICKLOW."

BY CARLETON REA, B.C.I., M.A.

Hon. Sec. British Mycological Society.

During the annual week's fungus foray of the British Mycological Society held at Dublin in September, under the auspices of the Dublin Naturalists' Field Club, from September 19th–24th, 1898, some 430 species of fungi were determined by the members. Of this number 274 had been recorded in the list recently published by Mr. Greenwood Pim (pp. 173–185 of this volume), whilst 160 were additions and are enumerated in the following list. The estates and demesnes visited during the foray were as follows:—Monday, 19th September—Howth; Tuesday, 20th September—Powerscourt; Wednesday, 21st September—Brackenstown; Thursday, 22nd September—Ballyarthur; Friday, 23rd September—Woodlands, Lucan; and Saturday, 24th September—Dunran.

Scleroderma
verrucosum, Pers.—Howth.

Auricularia
mesenterica, Fr.—Brackens-
town.

Exidia
glandulosa, Fr.—Ballyarthur.

Lycoperdon
pyriforme, Schaeff, var. ex-
cipuliforme, Desm. —
Brackenstown.
perlatum, Pers.—Powerscourt.

Calocera
cornea, Fr.—Howth.

Clavaria
fusiformis, Sow. — Brackens-
town.
fragilis, Holmsk. — Howth,
Ballyarthur, and Dunran.

Exobasidium
vaccinii, Woronin.—Dunran.

Craterellus
clavatus, Fr.—Ballyarthur.

Cyphella
villosa, Karst.—Brackenstown.
dochmiospora, B. and Br.—
Powerscourt.

Hydnum
rufescens, Pers.—Powerscourt.
cinereum, Bull.—Dunran. New
to the British Fungus-Flora.
auriscalpium, Linn.—Howth.

Hydnum
denticulatum, Pers. — Brack-
enstown.
udum, Fr.—Howth and Powers-
court.

Trametes
mollis, Fr.—Powerscourt.

Poria
vitrea, Pers.—Brackenstown.
radula, Fr.—Ballyarthur.

Polystictus
abietinus, Fr.—Howth.
Wynnei, B. and Br.—Powers-
court.

Fomes
annosus, Fr.—Howth, Powers-
court, Brackenstown, Bally-
arthur, and Dunran.

Polyporus
adustus, Fr.—Howth and
Ballyarthur.
chioneus, Fr.—Howth.

Boletus
parasiticus, Bull.—Ballyarthur.
aurantiporus, Howse.—Howth
and Dunran.
crassus, Mass.—Dunran.
luridus, Schaeff, var. eryth-
ropus, Fr. — Howth and
Powers-court.

porphyrosporus, Fr.—Dunran.

Coprinus
lagopus, Fr.—Brackenstown

- Psathyrella*
atomata, Fr. — Powerscourt and Ballyarthur.
- Gomphidius*
gracilis, Berk. — Ballyarthur.
- Psathyra*
corrugis, Pers. — Howth, Powerscourt, Brackenstown, and Dunran.
- Psilocybe*
semilanceata, Fr. — Howth, Ballyarthur, and Woodlands.
var. cærulescens, Cke. — Howth and Ballyarthur.
- Hypopholoma*
hydrophilum, Bull. — Howth, Powerscourt, and Ballyarthur.
- Stropharia*
albocyanea, Desm. — Howth.
inuncta, Fr. — Howth and Dunran.
stercoraria, Fr. — Powerscourt and Ballyarthur.
- Agaricus*
xanthoderma, Genev. — Howth and Powerscourt.
hæmorrhoidarius, Schulz. — Woodlands and Dunran.
- Cortinarius (Hygrocybe)*
castaneus, Bull. — Powerscourt.
leucopus, Bull. — Howth and Ballyarthur.
acutus, Fr. — Brackenstown, Woodlands, and Dunran.
- C. (Telamonia)*
torvus, Fr. — Powerscourt and Ballyarthur.
hinnuleus, Fr. — Howth and Ballyarthur.
hemitrichus, Fr. — Howth and Brackenstown.
paleaceus, Fr. — Howth, Ballyarthur, and Dunran.
- C. (Dermocybe)*
caninus, Fr. — Ballyarthur.
cinnamomeus, Fr. — Powerscourt and Dunran.
var. semisanguineus, Fr. — Ballyarthur.
- C. (Inoloma)*
alboviolaceus, Fr. — Dunran.
- C. (Myxaciium)*
elator, Fr. — Howth, Powerscourt, Ballyarthur, and Dunran.
- C. (Phlegmacium)*
infractus, Fr. — Ballyarthur and Woodlands.
fulgens, Fr. — Woodlands.
- Tubaria*
furfuracea, Pers. — Howth, Powerscourt, Brackenstown, Ballyarthur, and Dunran.
paludosa, Fr. — Powerscourt
- Flammula*
inopoda, Fr. — Brackenstown.
- Naucoria*
badipes, Fr. — Howth, Brackenstown, and Dunran.
erinacea, Fr. — Howth.
escharoides, Fr. — Howth, Brackenstown, and Dunran.
- Hebeloma*
fastibile, Fr. — Powerscourt and Ballyarthur.
- Inocybe*
cinninata, Fr. — Howth and Ballyarthur.
pyriodora, Fr. — Powerscourt and Ballyarthur.
asterospora, Quel. — Howth, Ballyarthur, and Woodlands.
- Bolbitius*
fragilis, Fr. — Powerscourt.
- Pholiota*
spectabilis, Fr. — Howth and Ballyarthur.
- Claudopus*
variabilis, Pers. — Brackenstown.
- Eccilia*
griseorubella, Lasch. — Ballyarthur.
- Leptonia*
incana, Fr. — Howth and Dunran.
- Nolanea*
pisciodora, Cesati. — Brackenstown.
- Entoloma*
sericellum, Fr. — Powerscourt and Ballyarthur.
sericeum, Fr. — Powerscourt and Woodlands.
- Pluteus*
cervinus, Schaeff. — Ballyarthur.
- Lenzites*
betulina, Fr. — Powerscourt.
- Cantharellus*
cinereus, Fr. — Ballyarthur.
aurantiacus, Fr. — Howth, Powerscourt, Ballyarthur, and Dunran.
- Nyctalis*
asterophora, Fr. — Ballyarthur.
- Hygrophorus*
lætus, Fr. — Howth, Powerscourt, Brackenstown, Woodlands, and Dunran.

- Hygrophorus
 calyptræformis, Berk.—Dunran.
 chlorophanus, Fr.—Howth and Powerscourt.
 unguinus, Fr.—Howth and Ballyarthur.
 nitratu, Pers.—Howth, Powerscourt and Woodlands.
 ovinus, Bull.—Powerscourt and Woodlands.
 eburneus, Bull.—Woodlands and Dunran.
- Omphalia
 rustica, Fr.—Ballyarthur.
 integrella, Pers.—Ballyarthur.
- Clitocybe
 fumosa, Pers.—Powerscourt.
- Lactarius
 turpis, Fr.—Howth.
 circellatus, Fr.—Ballyarthur.
 chrysorrheus, Fr.—Woodlands.
 glyciosmus, Fr.—Howth.
 fuliginosus, Fr.—Howth and Ballyarthur.
 serifluus, Fr.—Powerscourt.
 camphoratus, Fr.—Howth and Ballyarthur.
 subumbonatus, Lindgr.—Howth and Powerscourt.
- Russula
 lutea, Fr.—Ballyarthur.
 armeniaca, Cke.—Howth and Dunran.
 puellaris, Fr.—Powerscourt.
 galochroa, Fr.—Howth.
 fellea, Fr.—Ballyarthur.
 drimeia, Cke.=expallens, Gillet.—Howth, Ballyarthur, and Dunran.
 granulosa, Cke.—Howth, Powerscourt, and Ballyarthur.
 consobrina, Fr.—Powerscourt.
 var. sororia, Fr.—Ballyarthur.
 fragilis, Fr.—Howth, Brackentown, Ballyarthur, and Dunran.
 var. violacea, Quel.—Howth and Ballyarthur.
 Queletii, Fr.—Ballyarthur.
- Mycena
 leucogala, Cke.—Howth and Ballyarthur.
 sanguinolenta, A. and S.—Howth, Powerscourt, Ballyarthur, and Dunran.
- Mycena—continued.
 hæmatopa, Pers.—Brackentown.
 acicula, Schaeff.—Howth.
 amicta, Fr.—Howth and Ballyarthur.
 pullata, Berk and Cke.—Ballyarthur.
 amoniac, Fr.—Powerscourt.
- Collybia
 longipes, Bull.—Dunran.
 maculata, A. and S.—Powerscourt and Ballyarthur.
 nitellina, Fr.—Powerscourt.
- Tricholoma
 resplendens, Fr.—Powerscourt.
 saponaceum, Fr.—Powerscourt and Ballyarthur.
 inamœnum, Fr.—Howth.
- Lepiota
 acutesquamosa, Weinm.—Howth, Brackentown and Dunran.
 felina, Pers.—Howth.
 sistrata, Fr.—Ballyarthur.
- Amanita
 porphyria, Fr.—Ballyarthur.
- Puccinia
 Baryi, B. and Br.
- Melampsora
 epitea, Kze. and Schum.—Powerscourt.
 circeæ, Schum.
 vacciniorum, Link.
- Verticillium
 lateritium, Berk.—Howth.
- Zygodemus
 fuscus, Corda.—Ballyarthur.
- Ramularia
 calcea, Ces.—Woodlands.
- Orbilia
 auricolor, Sacc.—Howth.
- Coryne
 sarcoides, Jacq.—Howth.
- Ascobolus
 vinosus, Berk.—Howth.
 atrofuscus, Phil. and Plow.—Brackentown.
- Ascophanus
 carneus, Boud.—Howth.
- Mollisia
 fallax, Gillet.—Powerscourt.
- Helotium
 imberbe, Fr.—Powerscourt.
 lutescens, Fr.—Powerscourt.
- Erinella
 juncicola, Fckl.¹—Powerscourt and Brackentown.

¹ A distinct species, included by Massee, Vol. iv., p. 303, under *E. apala*, which is fawn colour outside, while this is quite white and much smaller in the ascophore, but the spores are longer.—CHAS. CROSSLAND.]

Lachnea	Hypomyces
hybrida, Phil., var. lapidaria	aurantius, Tul.—Ballyarthur.
Cke.—Howth.	Hypocrea
dalmeniensis, Phil.—Howth.	splendens.—Brackenstown.
Humaria	Hydnотrya
carbonigena, Sacc. — Bally-	Tulasnei, Berk. and Br.—
arthur.	Howth.
Xylaria	Numularia
hypoxylon, Grev.—Howth.	Bulliardii, Plow.—Powerscourt.
Stigmatea	Pilaria
robertiana, Fr.—Brackenstown.	anomala, Ces.—Howth.
Leptosphaeria	Physarum
doliolum, Pers.—Powerscourt.	nutans, Pers. β genuinum.—
Lasio-sphaeria	Brackenstown.
ovina, Pers.—Howth, Powers-	Perichæna
court, and Brackenstown.	depressa, Libert.—Howth.
ADDENDA BY C. B. PLOWRIGHT, M.D., and GREENWOOD PIM, M.A.	
Mycena	Acrosperrimum
speirea, Fr.—Ballyarthur.	compressum, Tode.—Brack-
Nectria	enstown.
dacrymella, Nyl.—Brackens-	Phragmidium
town.	obtusatum, Fr. — Ovoca.
Eutypa	rubi idæi, Pers. — Ovoca.
Acharii, Tull.—Woodlands.	tortentillæ, Fekl.—Ovoca.
Worcester.	

NOTES.

ZOOLOGY.

BIRDS.

The Observation of Waders.

Dr. Patten's remarks upon the observation of Waders on their own ground (pp. 230, 231 of this volume), induce me to add a suggestion or two to his. The difficulty of observing these birds in India is much less than here, as they are in many places, little persecuted; and become fearless. There are very few Waders of Europe that are not found in India during the winter, and there is, therefore, a good deal of information about their habits in the works of Jerdon and Blanford, Oates, Allan O. Hume, and others; and in Indian scientific periodicals, such as "Stray Feathers" (long wound up and bound up), and the different Societies' journals. Most of these are probably to be had in Dublin, and they will often be found to contain useful matter.

I would suggest further, that whoever wants to study the habits of Waders had better leave his gun at home, and take instead of it a good stick suitable to his ground and a field-glass. The colours of the glass should be inconspicuous; there should be no bright metal about it; and as little black japanned metal as possible, and it should be handled as cautiously as firearms. Some birds can see a man putting up his glass a long way off; and they are wisely suspicious of such motions. A quiet pony or donkey on ground where he can travel will often bring the observer much nearer to the birds than he can hope to win on two legs
Chelsea, London.

W. F. SINCLAIR.

Bird Songs.

I have observed the criticism on my "Dictionary of Bird Notes (p. 244), and (although it may be somewhat unusual) I venture to say that I quite agree with the critic's statement that it "cannot be pronounced complete." My object in writing is to solicit aid in remedying its shortcomings: both by pointing out "notes" which may be given incorrectly and supplying others which are not recorded. Any "aids to identification without slaughter," in the way of manners and markings, easily discernible when the birds are at large, will also be highly appreciated. Dr. Patten's paper, read before the Dublin Naturalists' Field Club, and printed in the October issue, is a step in this direction.

Possibly some reader of the *Irish Naturalist* may be able to identify a call which I have syllabled, "ku-ho" (hoarse and weird, reminding one of a Heron). I heard this about a year ago uttered by some five or six large birds flying high, and very fast, in a north-westerly direction.

CHAS. LOUIS HETT.

Springfield, Brigg, Lincolnshire.

PROCEEDINGS OF IRISH SOCIETIES.**ROYAL ZOOLOGICAL SOCIETY.**

Recent gifts include a Sambur Deer-fawn from Viscount Powerscourt, and Rainbow Trout from Mr. W. H. Armistead. Four Golden Agontis have been born in the Gardens, a pair of Cassowaries and a Cuckoo purchased.

11,043 persons visited the Gardens during October.

BELFAST NATURALISTS' FIELD CLUB.

NOVEMBER 2.—OPENING CONVERSAZIONE in the Free Library. Tea was served in the News Room. In the Grainger Room, Robert Pell had a collection of fossil sponges on exhibition. H. L. Orr exhibited a collection of land and fresh-water shells and some live lizards. John Hamilton showed live toads and slow-worms. Many members visited the Art Galleries, where the pictures of the Art Society were on exhibition. In the Reference Library, Robert Welch displayed a large collection of shells collected this summer in County Kerry, as well as living specimens of the Kerry Slug. On the same table the Hon. R. E. Dillon had a fine collection of lepidoptera. G. P. Farran, of the Dublin Field Club, exhibited a collection of shells from shell-pockets in West Donegal, and F. J. Bigger exhibited living snails from the Grand Canal, Venice. Arranged on screens at one end of the room was a large collection of photographs taken in Kerry by R. Welch, his studies of plant-life being particularly fine. Rev. C. H. Waddell, B.D. (President of the Club), exhibited a collection of Irish brambles, illustrating the many varieties that may be found. Close to this was a collection of mounted algæ from the Antrim coast, exhibited by H. Hanna, B.Sc. The next table was devoted to microscopy. Professor W. H. Thompson, M.D.,

had elaborate apparatus to record muscular contractions. Professor Lorraine Smith, M.D., showed the bacilli of diphtheria, anthrax, and tuberculosis. W. D. Donnan, M.D., exhibited living specimens of *Meliceria* and *Floscularia*; Cecil Shaw, M.D., nerve cells; John Tennant, M.B., the plasmodium of malarial fever. Miss M. K. Andrews exhibited sections of trachytes and rhyolites from County Antrim, showing also the rocks from which the slides were cut. The exhibit of Joseph Wright, F.G.S., attracted much attention. He showed a collection of foraminifera from the Pleistocene clay of St. Erth, Cornwall; some of the species are extremely rare, and Mr. Wright is again to be congratulated for the discovery of several forms which are new to science, which he exhibited. A. Speers, B.Sc., exhibited a number of rock sections and sands by the microscope; John Brown, crystals from the granite of the Mourne Mountains; N. Carrothers, a collection of mounted plants; G. McLean, a large number of mounted seeds; J. H. Davies, *Elatine Hydropiper*, lately discovered in the Lagan Canal; also *Solanum nigrum*, the Black Nightshade, from near Lisburn. The seeds of *Elatine Hydropiper* were exhibited by W. Gray, M.R.I.A. At various other tables exhibits were made by Professor Symington of hand-lenses for low-power work; H. Gore Cuthbert, terminal cells of *Collete pisistigma* from Castlegregory; Professor T. Johnson, Slime-fungi; J. Vinycomb, book-plates; John Adams, fresh rare plants from County Antrim; L. M. Ewart, beetles and large grasshoppers, collected in the Ligurian Riviera, 1898; G. H. Carpenter, B.Sc., the nest of *Atypus piceus*. Dr. Scharff and Mr. Welch also exhibited specimens of *Mysis relicta* which they recently dredged in Lough Neagh.

At nine o'clock the President, Rev. C. H. Waddell, made a few remarks on the objects and aims of the Club, after which the lights were lowered and a lantern display given. All the lantern slides were illustrative of the Club's excursions during the past summer. William Gray described the local excursions. W. J. Fennell dealt with the local excursions and the Irish Field Club Union's excursion to Kerry, followed by J. St. J. Phillips on the same excursion.

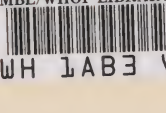
DUBLIN NATURALISTS' FIELD CLUB.

OCTOBER 18.—The OPENING CONVERSAZIONE of the Winter Session was held in the Royal Irish Academy House. In spite of the very unfavourable weather a large number of members and their friends were present. It needed only a very casual inspection to see that the work of the Club was well represented in various branches of natural history by the numerous contributions by different members. Additional interest was given to the meeting by the presence of several members of the Belfast Naturalists' Field Club, including the President, Rev. C. H. Waddell M.A., B.D., Miss S. M. Thompson, and Mr. R. Welch. The President, R. Lloyd Praeger, B.A., B.E., demonstrated a series of lantern slides prepared by R. Welch, J. Fennell, and J. St. J. Phillips, illustrating features in County Kerry, visited by the Irish Field Club Union in July. This exhibition was followed later by one by H. J. Seymour, B.A. (Hon.

Sec.) on some geological features from the same district. In the unavoidable absence of Greenwood Pim, M.A., Dr. E. J. M'Weeney demonstrated for him a series of lantern slides of fungi, one of which, *Pimmia parasitica*, perpetuates Mr. Pim's name as an Irish mycologist. In the intervals between the lantern exhibits opportunity was taken to inspect the scientific exhibits, of which the more important were as follows:—Dr. N. H. Alcock, maps and specimens illustrating the distribution of Irish bats; Rev. Dr. C. W. Benson, some alpine birds; F. W. Burbidge, M.A., F.L.S., a collection of plants from the Trinity College Gardens; G. H. Carpenter, B.Sc., and J. N. Halbert, sample insect-cases for the Museum collection of Irish animals; Rev. M. H. Close, M.A., F.G.S., and J. G. Robertson, illustrations of cromlechs; G. Coffey, M.R.I.A., some ancient Irish objects made of Yew; Prof. G. A. J. Cole, F.G.S., specimens and microscopic slides illustrating the older rocks of County Tyrone; H. K. Gore Cuthbert, a Magpie Moth series, and fossiliferous stones from the Feale, Co. Kerry; Hon. R. E. Dillon, insects collected in the West of Ireland; G. P. Farran, land-shells from "shell pockets" in sand-hills, West Donegal; Dr. A. H. Foord, F.G.S., 1. fossils from Skerries and Cork; 2. Some original drawings of fossils; Dr. W. Frazer, coloured drawings of Miocene plants from County Antrim; Mrs. W. S. Green, some Connemara marble objects, Streamstown; H. Hanna, M.A., B.Sc., 1. Some algæ from the North-east coast of Ireland; 2. Desert sands and Nile mud (May, 1898); T. Johnson, D.Sc. (Hon. Sec.), some fungi collected by the British Mycological Society in Cos. Dublin and Wicklow; W. F. de V. Kane, M.A., J.P., microscopic slides of a rare Phyllopod; Dr. E. B. Knox, Wood Sandpipers, fractures obtained in taxidermy, etc.; D. M'Arde, microscopic slides and specimens of rare Liverworts; Prof. E. J. M'Weeney, M.D., demonstration of a method for obtaining the motile protozoa of a given water-sample; F. W. Moore, M.R.I.A., a collection of plants from the Royal Botanic Gardens, Glasnevin; A. R. Nichols, B.A., rare Irish marine invertebrates; B. T. Patterson, C.E., fungi from Dunran; Dr. C. J. Patten, group of small wading birds (Tringidæ) from Dublin Bay, collected and preserved by exhibitor; J. St. J. Phillips (Hon. Sec. B.N.F.C.), rhyolites of Benaunmore; Colonel Plunkett, fruiting specimens of dry-rot fungus; Henry J. Seymour, B.A. (Hon. Sec.), specimens of Smithsonite, from Santander zinc mines Spain, lent by kind permission of the President of University College, Stephen's-green; Miss L. Shackleton, water-colour drawings of British flowering plants; Dr. R. F. Scharff, B.Sc., and R. Welch (B.N.F.C.), *Mysis relicta*—a fresh-water shrimp from Lough Neagh; Mrs. J. T. Tatlow, a collection of marine shells from Achill Island, etc., arranged on costumes of various centuries in English history; Rev. C. H. Waddell, M.A., B.D. (President, B.N.F.C.), a collection of Irish Brambles; R. Welch (B.N.F.C.), 1. Land and fresh-water shells collected on I.F.C.U. excursion in Kerry, including living specimens of the Kerry Slug *Geomalacus maculosus*; 2. Natural history photographs taken on I.F.C.U. excursion, Kerry.



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